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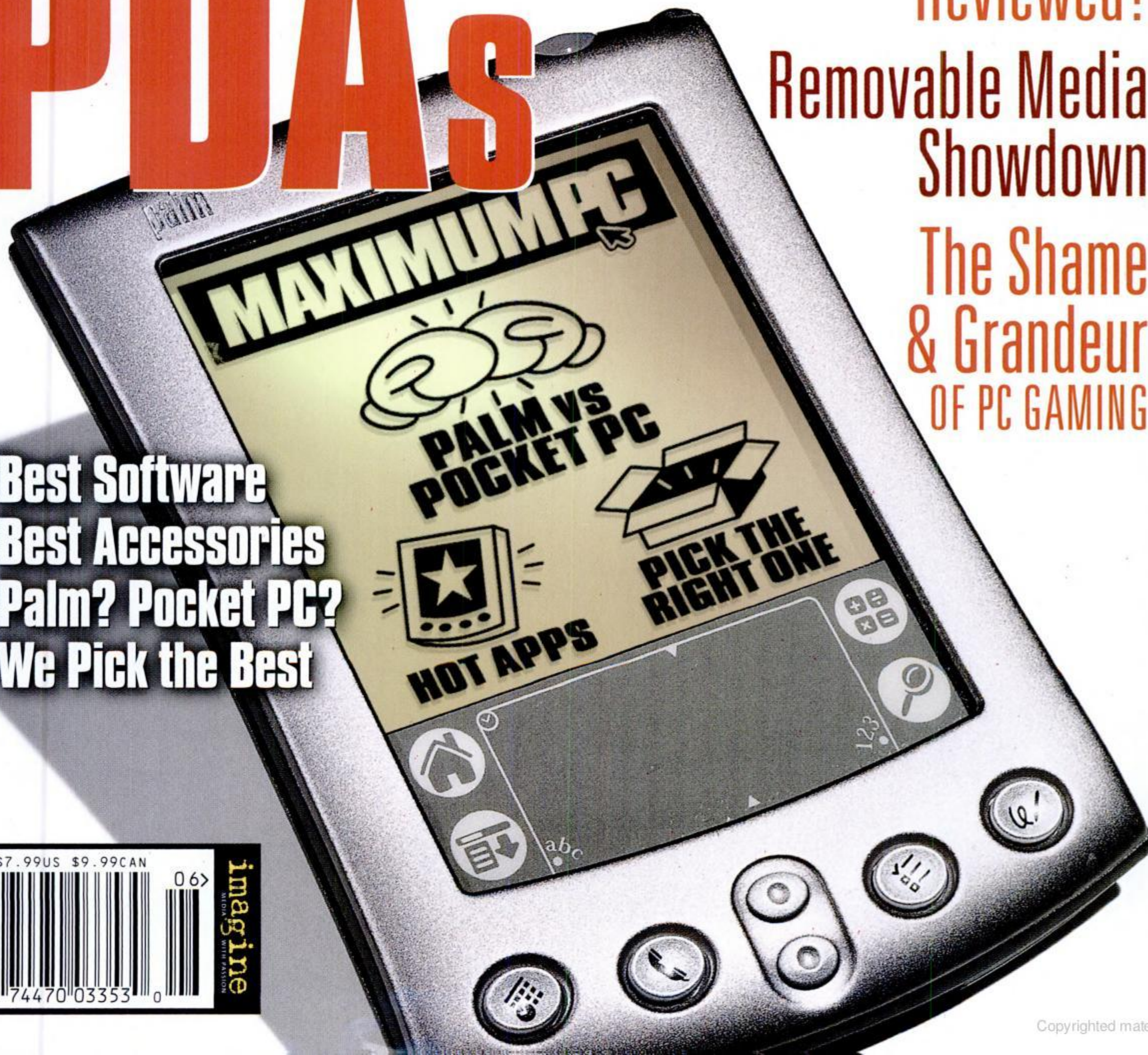
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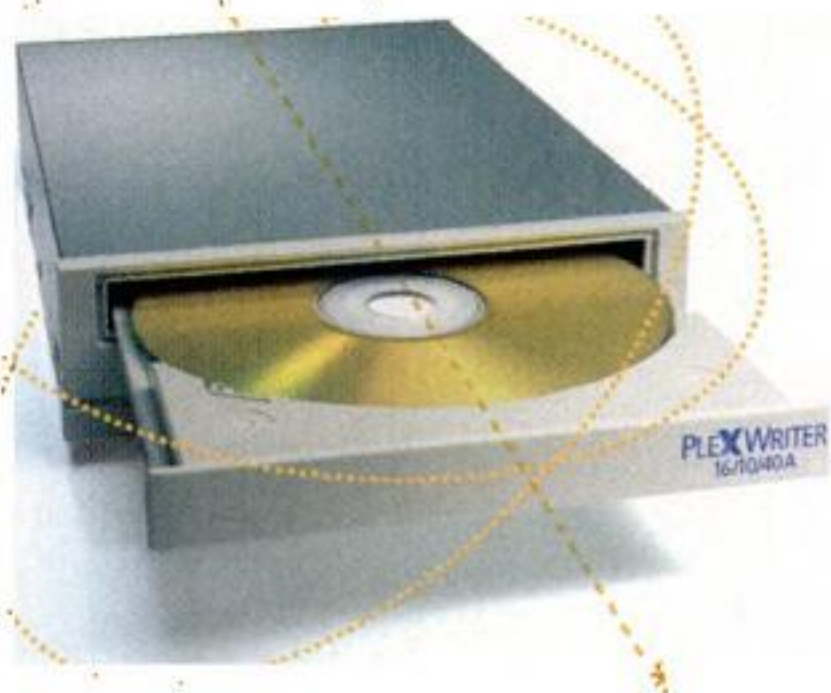
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## Release Notes



### A new look for a new PC

**W**elcome to *Maximum PC* Version 2.0, the latest evolution of an ever-evolving magazine. We burst onto the scene in 1996 under the name of *boot*, and in 1998 we adopted the name with which you're probably most familiar. This month, we present a sweeping new graphic design, and update our coverage for a new era of PC fanaticism.

Our old look-and-feel was comfy and familiar, but reeked of a bygone era. Let's face it: When your high-tech magazine doesn't look as high-tech as the products you're covering, you know you've got a problem. Our new look-and-feel is based on thinner lines, a classier color scheme, the Stone Serif and Universe font families, and what we like to call "functional" lead art. In *Maximum PC* V.1, we tended to simply

publish big photos and illustrations that stood by themselves. In *MPC* V.2, we seize every opportunity to caption the most interesting details in each

*Our old look-and-feel was comfy and familiar, but reeked of a bygone era.*

piece of art. Why? Because information is power, and you want to be equipped with as much power as possible when making expensive purchasing decisions.

We've also changed some of our departments. Inside Sources has been replaced by Quick Start, an assortment of previews, opinions, and oddball knick-knacks that should both surprise and delight. Our new Head2Head section pits natural PC competitors against each other in a battle of competing features. A new How To department helps you tweak your PC experience, and we finish the magazine with *Exit*, a glimpse at the world of PCs through a radical filter.

Along with all these changes, we're making a commitment to thoroughly review the emerging class of PC entertainment, connectivity, and creativity products. Vendors are flooding store shelves with devices that depend on the PC to function—and we'll be telling you whether this hardware does in fact work as advertised. So please check out our new beginning, and turn to page 103 for a peak at next month's articles. This magazine is a permanent work-in-progress, and you can help us change it for the better by sending constructive criticism to [editor@maximumpc.com](mailto:editor@maximumpc.com).

—JON PHILLIPS



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We give 31 awards that laud and lampoon the most interesting—and shameful—games of the past year.

## COVER FEATURE

# Mastering Your PDA

**Choose the perfect digital assistant to mobilize your crucial data.**

Can you really afford to leave your most important data locked on your desktop PC? Nope—and you don't have to. We detail the essential elements of any PDA, compare Palm and Pocket PC, and deliver the details on the latest breed of little wonders.







## PCs—Now with Cupholders!

If the auto industry evolved as quickly as the PC industry (as Jon Phillips wrote in his May editorial), your car engine would stall twice a week and you'd have to turn off the ignition to get it started again. Twice a year you'd have to reinstall the engine, and after two years you'd be forced to buy a new car because parts would no longer be available.

—Stephen Bucaro

### MATH IS LESS FUN THAN WE ORIGINALLY THOUGHT

If Mrs. Schartung ever got ahold of Will Smith, she would smack the bejesus out of him for using fuzzy math in his discussion of GeForce3 performance results ["Fun with Math," May letters]. Percentage calculations are always relative to the base amount; Will's formula is incorrect. Here's an example you might relate to: If the Dow went from 45 last year to 203 this year, this would represent an increase of 351 percent. On the other hand, if the Nasdaq went from 203 last year to 45 this year, it would represent a drop of 78 percent. I'm afraid Daniel, the guy who first challenged your math, was right.

—Rob Fakhoury

***"Are you honestly suggesting that PC game developers create software that will force us to upgrade hardware?"***

**WILL SMITH RESPONDS:** In the April 2001 GeForce3 article, we calculated the percentage *difference* between the GeForce2 Ultra and GeForce3, not the percentage *increase*, which is what most readers expected to see. Unfortunately, we confused the issue by using imprecise language in the feature. Of the hundreds of readers who wrote in to comment on my "Fun with Math" response,

only Chad Barbry noted that I did in fact use the term "performance delta" in the original benchmark analysis [April 01]. And as Chad so adroitly points out, "delta" is the chemistry symbol for "change" or "difference," so the term "performance delta" really means "performance difference," not "performance increase."

Because we were primarily interested in the GeForce3, we set it as the zero point, rather than the GeForce2 Ultra, which may have been a better zero-point candidate. For the record, in the AquaNox test, the GeForce3 is 351 percent faster than the GeForce2 Ultra on the 733 test system.

### PLEASE TELL US A TOY STORY

This letter is to Jon Phillips in response to his April editorial, "Challenge Our Hardware—Now!" I have a question: Are you high? Are you honestly suggesting that PC game developers create software that will force us to upgrade hardware? I think I speak for most PC owners, even the *Maximum PC* types, when I say we're already tired of plunking down hard-earned cash for system components that are outdated before we can get them home and out of the box. How about challenging developers to make some real innovations and cram some of your so-called "killer apps" into well-written, tight code that will run on systems we common folk own?

—Bill Krafick

**JON PHILLIPS RESPONDS:** Hi, Bill, thanks for sending in your two cents. All views, especially dissenting views, are welcome. Now, of course,

more tightly written code is a given; developer code should always be efficient and leverage every last circuit path of existing hardware. However, the fact remains that today's 3D games are not *Toy Story*-caliber. A new 3D technology (pixel and vertex shading) has arrived, however, and it allows games to reach that much closer to realism. So let's take advantage of this technology. *Maximum PC* is a magazine for people who treat PC computing as a personal passion, and like most hobbyists, we're willing to spend more money for the highest-quality experience.

Am I high, you ask? You betcha—high on life!

### THE TIMES, THEY ARE A-CHANGING

I scored 37 ["Test Your Geek Quotient," May 01], and I've been with *Maximum PC* since November 1996, when it was named *boot*. I could retire at age 55 before my subscription expires in December 2004, and I don't like men who wear purple fingernail polish. I wanted to ask Jon Phillips, what kind of geek am I? Old Fart Geek?

—Roger Price

**JON PHILLIPS RESPONDS:** Oops, I left out one of the case studies from the Geek Test. Here's the missing profile for Old Fart Geek:

**Occupation:** By day, he works at a mysterious job that no one knows about. By night, he writes cryptic letters to the editor. Pastimes: Wiles away the days before retirement by answering technology quizzes in PC magazines, and questions his place in a world where male associate tech editors flout all convention by wearing traditionally female cosmetics. Quote: "I've been with *Maximum PC* since November 1996." Identifying



Markings: T-shirt bearing the slogan, "I scored 37 on the Geek Quotient Test!"

To answer Roger's question: Yes (wink, wink).

### DON'T MOBOS MATTER?

I just finished reading "Gaming Titans" [April 01]. I thought you guys did a great job reviewing these three monster rigs of gargantuan gaming grandeur, but I noticed that when choosing the winners of the best components, you left out the motherboards! What is up with that!? I would think that the mobo would be a critical component of any PC.

—Adam Rust

**GORDON MAH UNG RESPONDS:** A motherboard is indeed a critical part of any PC, and in our full system reviews, we do discuss the motherboard and its capabilities. However, for the purposes of "Titans," we focused on what the boxes were made for: gaming. Since all three rigs were based on AMD's 760 chipset and were all DDR machines, there was honestly very little to be said about the motherboards in this case. If we had been evaluating these rigs for upgrading or overclocking readiness, motherboards would have been central to the debate.

### CUT, COPY, PASTE

► In "Test Your Geek Quotient" [May 01], we claimed that ATA/100 hard drives require an 80-pin connector. This is incorrect. These drives use a 40-pin connector, which is attached to a cable with 80 wires.

► In "PC Pranks" [May 01], we provided instructions for placing a fake folder on a desktop, but we never provided instructions for removing the folder. So here's how to do it: At a DOS prompt, type "RD" (without quotes), hit the spacebar, then type the name of the fake file—but where spaces are in the name, hold down ALT and type 255 on the keypad. The key is to use the ASCII code in the same places you used it to create the folder.

► In the FireWire hard drives review [March 01], we incorrectly stated that Maxtor's FireWire PCI adapter card only works with the DiamondMax 80GB. In fact, Maxtor's FireWire adapter is fully IEEE-1394 compliant and supports other FireWire-compliant devices.

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**DILEMMA:** You don't like this issue of the magazine, and you want your money back. You can't bear the thought of going through customer service, because the last time you called a customer service center, you endured an automated response script so tedious, you developed a case of agita that persists to this day. So how do you get your due? *How do you get your due?*



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Each month<sup>1</sup>, the *Maximum PC* editorial staff will remit full single-issue refunds to the three individuals who can prove they hate the magazine the most. Get cheap. Get nasty. But make it fun for everyone. If you can write one of the three cleverest, craftiest hate letters of the month<sup>2</sup>, you'll win \$7.99 (U.S.) directly from the pockets of the *Maximum PC* editorial staff. We will pony up the dough, put it in a bag, and send the cash to you (fully insured), along with a bag of *Maximum PC* schwag, including a hat, which can be cut up into little pieces if you want, because it's felt.

But the fun doesn't end there. We'll also run the best hate letters in the magazine. And sometimes we'll run pictures of the magazine staffers ponying up their own, hard-earned money in shame. And other times we'll run pictures of the lucky (or, rather, disgruntled) winners. We'd like to have a picture of you holding your bag of money at the front door of your house, just like if you'd won Publishers Clearing House. Except you wouldn't be holding a big Publishers Clearing House check, but rather a much, much smaller bag of money.

For the first month's contest, you'll have exactly 14 days—from May 20 to June 3—to get us an e-mail that includes your letter. If we receive your e-mail *before* May 20, your submission will be disqualified. If we receive your e-mail *after* June 3, the mail will be immediately deleted. We'll receive the e-mail and think, "Hey, the contest is over, so we don't need this," and then delete the e-mail—quite summarily in fact.

Letters must be limited to 200 words; those exceeding 200 words will be disqualified. So what constitutes 200 words? Everything from your opening salutation (e.g., "Dear Incompetent...") to your closing sign-off (e.g., "With utter and complete contempt, Fabio Lanzoni"), inclusive<sup>3</sup>. We will take your submission, drop it straight into Microsoft Word 97, and run the word count tool. If the software reports that your submission is in excess of 200 words, the submission will be disqualified.

**Send your e-mail to [hatemail@maximumpc.com](mailto:hatemail@maximumpc.com).  
Snail mail will be disqualified because this is *Maximum PC*,  
and it's high time we all got with the program.  
Thank you, and best of luck.**

**Disclaimer:** *Maximum PC* invites all types of letters to the editor, those of praise (so we know what we're doing right) and those of condemnation (so that we know what we're doing wrong). But be forewarned: We do not run gushing letters of praise in the magazine. Also, please be aware that the word disclaimer offers no legal protection whatsoever.

<sup>1</sup> Each month—until we get bored with the contest, that is. <sup>2</sup> Here's a hint for all the people savvy enough to read footnotes: We're interested in receiving thoughtful, well-written venom rather than the smack-talking, folding-chair-tossing nonsense employed by most *Maximum PC* editors. <sup>3</sup> Inclusive means everything in the letter, including your salutation and sign-off.

**LETTERS POLICY:** MAXIMUM PC invites your thoughts and comments. Send them to [input@maximumpc.com](mailto:input@maximumpc.com). Please include your full name, town, and telephone number. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.



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or Satellite Pro 4600<sup>1</sup> wireless solution with Toshiba's no-risk wireless installation offer for just \$795.<sup>2</sup> Offer includes 10% off for up to eight portable computers and the installation of an access point for a 30-day trial. If you are not completely satisfied after 30 days, return the access point and portables to Toshiba and receive a full refund on all hardware.<sup>3</sup> If you liked the experience, you will be eligible to receive discounts on additional access points. *choose freedom™*

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# **TOSHIBA**



# Quick Start

The beginning of the magazine, where articles are small

THIS MONTH: CONNECTING COMPUTERS

## Introducing the Super-Router

Linksys to ship the Swiss Army knife of home networking

**D**espite being indispensable traffic cops for many home networks, routers tend to be expensive, difficult to configure, and painfully dull. But Linksys' GigaDrive SOHO Server promises to elevate the quotidian router to what is essentially a network server-in-a-box—with the same elegance and simplicity that made Quantum's SnapServer a hit. Plug in your Ethernet cables, and the seven-port extensible GigaDrive should handle all the dirty work of network addressing, allowing you to share a single broadband connection behind a built-in firewall.

With a Pentium-level CPU and 20GB hard drive on board, the GigaDrive SOHO Server will also perform stand-alone network server duties, meaning outside users can FTP or HTTP files stored on the GigaDrive. The SOHO Server is actually a small computer and runs the popular *Apache* server software. And besides working as a router, switched hub, hardware NAT, and DHCP server, the GigaDrive will also pull duty as a print server.

Drive capacity will initially be limited, but Linksys says it might eventually ship an 80GB hard drive or larger, and has grand visions of the device serving streamed media to other devices on your network or the Internet. About the only function the SOHO Server doesn't offer is wireless connectivity, but that is available by plugging in Linky's Wi-Fi WAP11 access point.

While the SOHO Server may not hold its own against a dedicated PC acting as a server, it also doesn't chew up the power of a PC, is quieter, and won't eat up precious desk space in your office. The SOHO Server is also a lot easier to configure. All this goodness should be on store shelves by now for about \$600. For more information, check out [www.linksys.com](http://www.linksys.com).



## Set Your VCR—Online

The future of web-controlled home appliances

**YOU MAY HAVE HEARD** that we here in California are dealing with some, uh, "energy issues." While our utility companies are dabbling with power-saving experiments—in between visits to bankruptcy court—emWare is working on tantalizing solutions not just for energy saving, but to bring complete automation to your entire home.

The company is currently partnering with manufacturers to embed low-cost microprocessors in devices and appliances that can be remotely monitored and controlled over any network or dial-up connection. You might some day turn off your coffeepot, activate an alarm system, and set your VCR, all from the web, thanks to emWare's Embedded

Micro Internetworking Technology. Appliance manufacturers will even be able to schedule remote diagnostics and e-mail you when something's gone awry. Carrier Corporation has already teamed up with emWare to develop therm-ostats that can be remotely tweaked by the consumer or utility company, or that automatically drop energy consumption during peak hours. Here in the Golden State, that means big bucks. For more info go to [www.emware.com](http://www.emware.com).



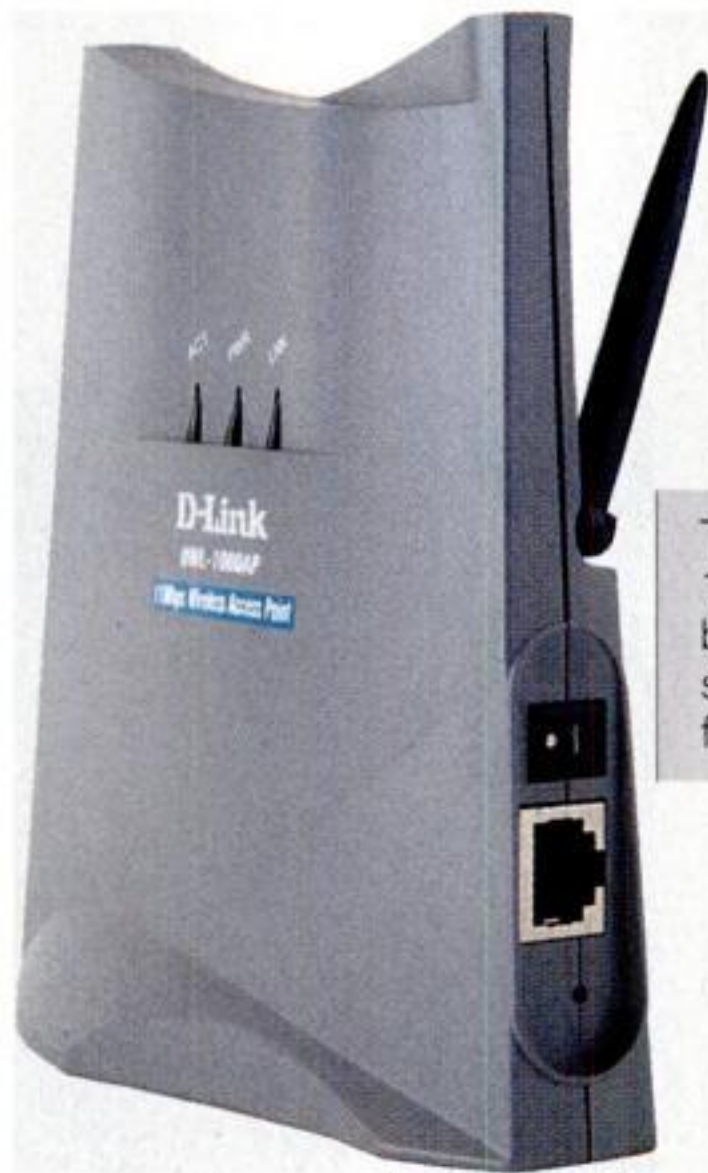


# Networking Pop-Quiz

PNA 2.0 vs. Wi-Fi

**PLANNING TO BUILD A HOME NETWORK** but don't know whether to use the Phoneline Network Alliance 2.0 standard (which uses standard phone jacks) or shell out for an 802.11b Wi-Fi wireless network? Answer these eight questions to find out which technology is right for you.

- Are your computers more than 100 feet apart? (The indoor range of Wi-Fi fades at about 150 feet.)
- Do you have a phone jack near all your computers? (If not, you'll have to lay down messy cabling for a phone-based network.)
- If you have more than one phone line in your house, are the computers all near the same line? (Your phoneline network will only work on a single line.)
- Do you play games that require minimal latency, such as *Quake III*, and *Unreal Tournament*? (Wi-Fi is prone to latency problems.)
- Does more than one person in your home play



The D-Link 1000AP rocks—but is its wireless strategy right for you?

games at the same time? (Wi-Fi bandwidth is shared among multiple users on a single access point.)

- Do you mainly use a desktop PC? (While both are good for desktops, Wi-Fi is especially handy for adding notebooks to a home network.)
- Do you want to spend less than \$100? (Phoneline is cheap; Wi-Fi is expensive.)

If you answered "yes" to four or more questions, you're better off setting up a HomePNA network. If you answered "no" to four or more questions, a Wi-Fi wireless LAN is the way to go.

## Internet Power Surge

Heavyweights push to bring broadband to your power outlets



Cisco Systems, 3Com, Compaq, Intel, and Motorola are just a few of the corporations behind the sinister-sounding HomePlug Powerline Alliance, which is developing a standard for delivering broadband directly to your AC outlet.

HomePlug 1.0 will define electrical-based home automation, Ethernet-class networking, broadband access, and streaming multimedia services. The challenge is that power lines are the noisiest modes of data transmission next to cans and string, and are prone to the extremes of attenuation and interference. Proprietary systems are already in place but haven't grown past home automation. Field trials have already begun, and the Alliance intends to launch compliant products, power line Internet devices, and "smart appliances" by the end of the year.



## Wireless Grande

Like to try a license agreement with your decaf crappaccino?

**THE 802.11B WIRELESS PROTOCOL**, colloquially known as Wi-Fi, just got a leg up in the competition to establish a wireless networking standard. Three goliaths of yuppimomics—Starbucks, Microsoft, and MobileStar—are conspiring to provide wireless access in Starbucks cafés.

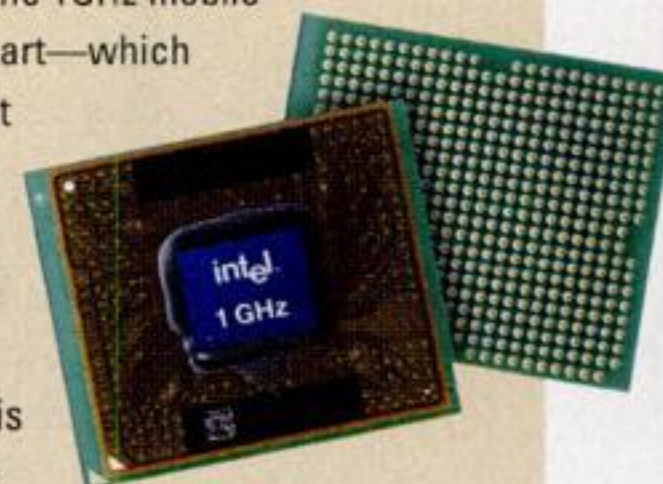
At participating Starbucks, you'll stroll in with your Wi-Fi enabled card and instantly connect to Microsoft's MSN. This service is free, but to surf beyond MSN, you'll have to pay for MobileStar's wireless service.

By the time you read this, Starbucks in San Francisco, Dallas, and Seattle should be Wi-Fi-ready, with 70-percent penetration in company-owned stores planned within two years.

## FUN-SIZE NEWS

### CPU Drought

Hoping to get ahold of a 1GHz notebook? Good luck. Intel says it's facing a shortage of the 1GHz mobile Pentium III part—which could make it incredibly difficult to buy a 1GHz notebook until early this summer. The company says the problem is demand-related and not due to an inability to make the chip.



### Better MP3s

MP3 audio quality will sound better and take up less space this summer. Thomson Electronics, which helped develop the MP3 format, is expected to release the MP3Pro codec this summer. A song encoded at 64Kb with MP3Pro will sound as good as one currently encoded at 128Kb with regular MP3. Or so they say.



### Intel, AMD Bump CPU Speeds

The silicon war rages on: Intel has pushed its Pentium 4 to 1.7GHz on its venerable 0.18-micron process. AMD, meanwhile, has pushed the Duron to 950MHz, and some expect a 1.5GHz Athlon by this summer.



### Kiss a CD Good Mornin'

Charley Pride's



new CD will feature technology that claims to be impervious to duplication.

SunnComm's proprietary CD copy protection aims to thwart people from burning the CD or ripping it to MP3, to the dismay of *Napster*-happy Charley fans. SunnComm hasn't released details of the technology, but experts believe it uses a combination of bad sectors and jumbled indexes that confuse CD-ROM drives.



## HELPFUL HINTS

# Windows Tips for Morons

By Dick Matthews, MCSE

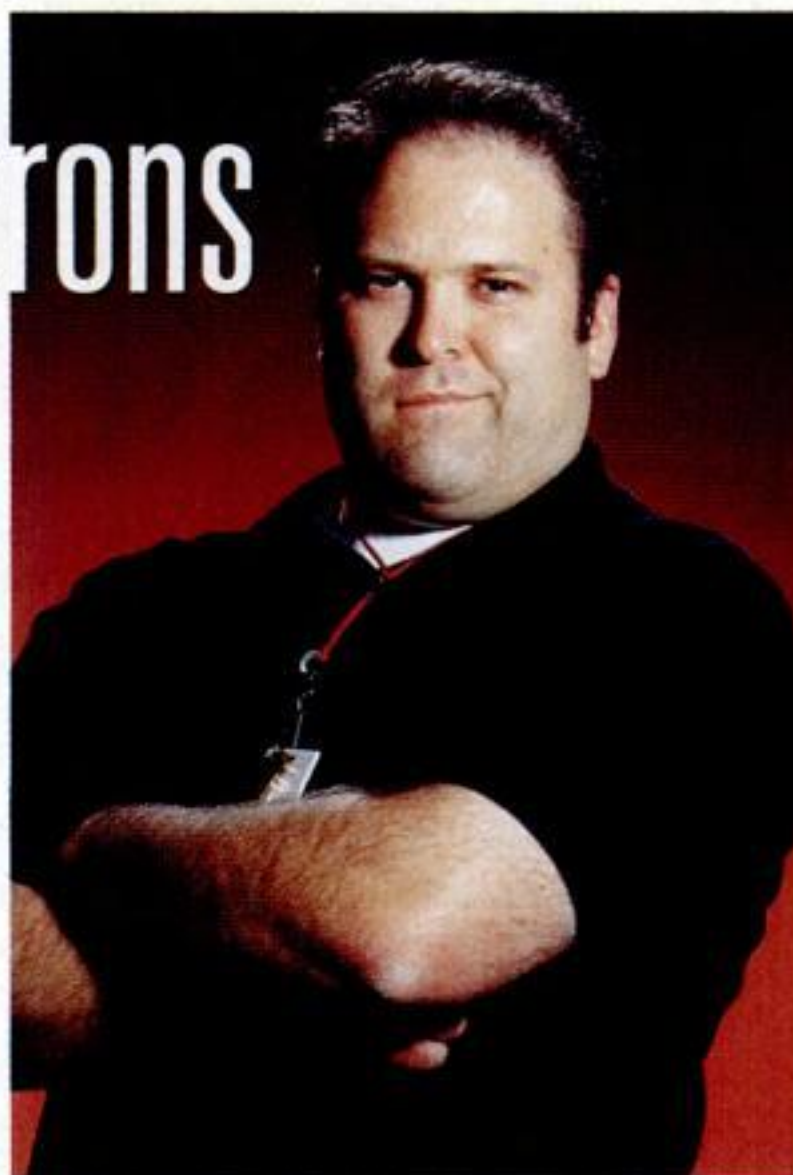
**L**et's get one thing straight from the get-go: I despise you. You're end-user scum, and, on a personal level, you just plain make me sick. But seeing as I'm slumming it in the tech-support pool this month, I'll toss you a few tips that might prove helpful as you bumble your way through Windows 98.

Let's start with the way you navigate folders. You're doing it all wrong. Your default is currently set to open a new window every time you double-click a folder. But there's a better way that's been adopted by most life forms that walk on two feet:

Double-click My Computer. Go to the View menu and select Folder Options. Choose Custom, and then hit the Settings button. Under Browse Folders, choose "Open each folder in the same window."

Still with me, Dipstick? Good. Because here are some other folder tips that should serve you well on your maiden voyage through the Sea of Competency:

- If you hold down Ctrl while double-clicking a folder, Windows will revert to the other navigation option.
- If you hold down Shift while double-



clicking a folder, Windows will shoot you to the Explorer interface for that folder.

- If you hold down Alt while double-clicking a folder, you'll get the Properties menu for that folder.
- Press backspace in a folder, and you'll make a beeline for that folder's parent directory.

And, Dipstick? One more thing: If your feeble, little, amphibian brain and webbed fingers find it too difficult to reach the Calculator by going to Start > Programs > Accessories, you can always bring up the Calculator by typing "calc" in the Start Menu's Run command.

OK, I'm done with you. Now run off to your precious little cigarette break, and never talk to me *ever* again.

## TAKE FIVE

## How Porn Is Driving the Internet

Online porn—it's the ultimate money shot. Think smut isn't defining successful Internet business models and driving net technology in general? Think again. The trade magazine *Adult Video News* believes up to \$2 billion is spent online annually for adult movies, toys, and subscription services. Here are five indisputable truisms:

**1. Porn singlehandedly established the annoying pop-up ad as a viable revenue-generating tool.** You first saw them on smut sites, but now they're everywhere—even on Maximumpc.com. And they work. As mainstream sites become more desperate for cash, expect more and more of them to page-jack your desktop with obnoxious, infinitely spawning pop-up routines.

**2. Porn drives the development of online fraud control.** Due to their constant battles with password and credit card theft, adult sites have pioneered anti-fraud technology, and many offer more responsive customer service than most mom-and-pop web stores.

**3. Porn pioneered the concept of "Internet partnerships."** *Business 2.0* magazine calls "partnerships" the 11th Principle of the New Economy. But the adult entertainment sites call it "link exchange," and they're making a killing in building their subscriber lists by driving traffic from site to site. This is how they grow and survive, and they do it better than any other type of online business.

**4. Porn is driving Internet interactivity.** No one will pay for streaming video from network news sites, but people will pay for video feeds from sex sites. Also, you may not have heard of teledildonics, but it could be the next big thing. These sex toys plug into your PC and work with web sites or software to, um, "stimulate" the viewer. While it may sound seedy, the devices could play a role in the medical treatment of sexual dysfunction... OK, yeah, it's mainly seedy.

**5. Porn drives innovations in subscription and advertising revenue.** It's taken billions of dollars and a cargo ship's worth of Harvard MBAs to figure out that Internet advertising shouldn't be based on cost per thousands of impressions (a.k.a. CPM), but rather cost per actions or cost per sales. While mainstream advertisers are just beginning to pay only for people who click on advertisements, the adult industry has done that since the mid-1990s. Likewise, even smug, highbrow sites such as Salon.com are now pimping paid exclusive content—something long ago pioneered by the porn industry.

## You Heard It Here First

**Q:** Will Microsoft's product-activation feature stop illegal copying of Windows XP or just piss off people?

"If people demand that their ostensibly democratic governments take action on the public's behalf, these governments could easily thwart Microsoft's efforts."

—Richard Stallman, Free Software Foundation



"People need to be made to understand and respect copyright requirements. No publisher wants to alienate its customers."

—Bob Kruger, VP of enforcement, Business Software Alliance



"I'm delighted that Microsoft is trying aggressive copy protection again. Perhaps this time they'll actually kill themselves with it. More seriously, what happens if you move to a new machine? Or alter the old one? What if you upgrade the processor? This will cause massive inconveniences. For every pirated copy they prevent this way, there will be two more legitimate copies they won't sell." —John Perry Barlow, Electronic Frontier Foundation





## FAST FORWARD

# Bluetooth Will Eat Your Cables

BY TOM R. HALFHILL



**P**Cs can be annoying in numberless ways, but the spaghetti-like mess of cables behind every computer is near the top of my list.

We've got cables for printers, monitors, speakers, headphones, keyboards, mice, modems, networks, joysticks, and more. Buy a digital camera, add another cable for the serial connection or memory-card reader. Buy a PDA, add another cable for the cradle. Sign up for broadband cable or DSL, add another cable for the external modem. The madness never ends.

Some companies (notably Apple) tried to solve this problem by adding infrared ports to their computers, but the idea didn't catch on. Now there's a solution that shows more promise: Bluetooth.

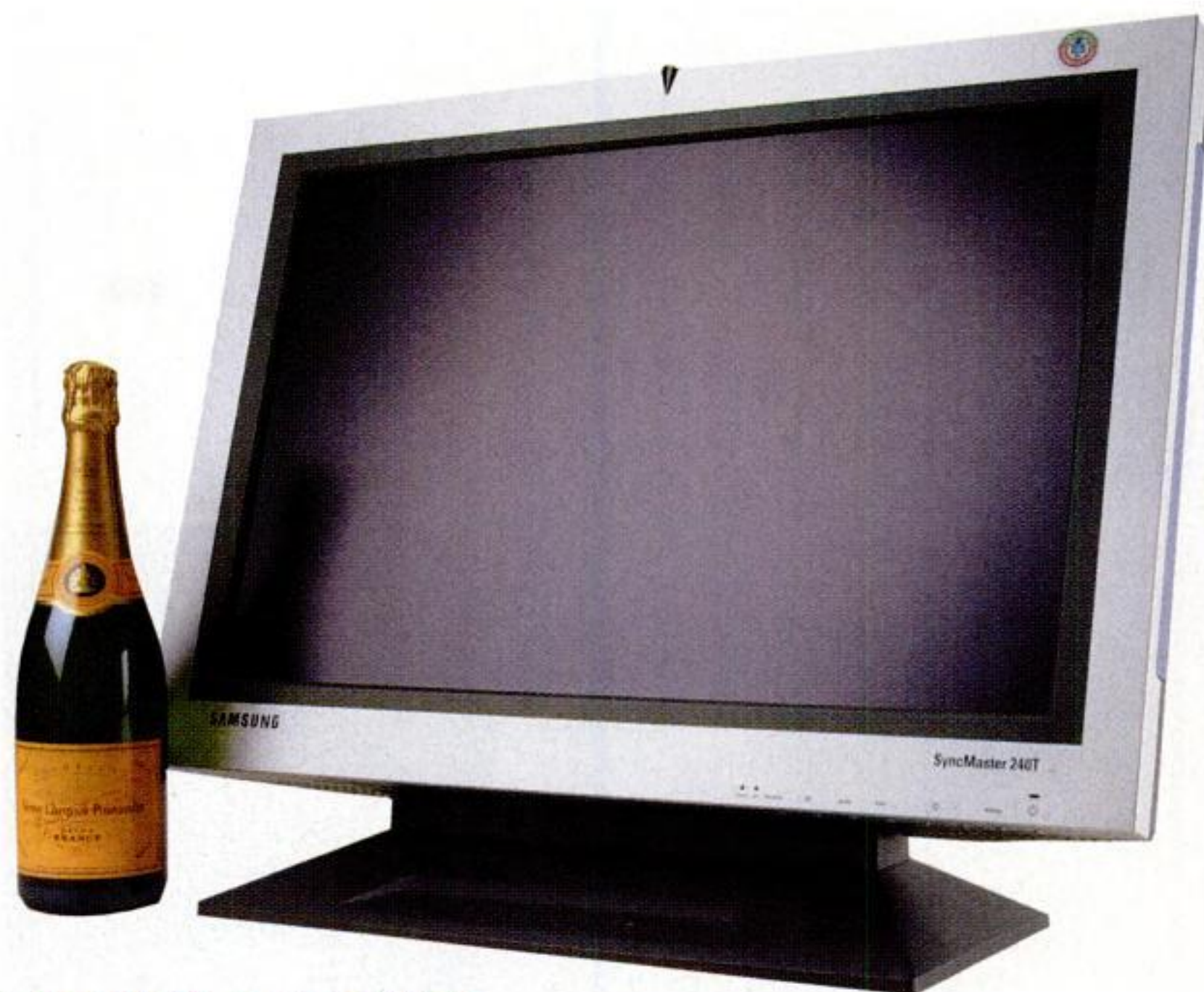
Bluetooth is a wireless-technology standard recognized by more than 2,000 companies worldwide. It's designed for short-range (10 meters), low-bandwidth (721Kbps) communications, either point-to-point or point-to-multipoint. The latter mode allows a PC to interface with several peripherals, or a roomful of people to establish an impromptu network of PDAs. Other applications include wireless earphones and wireless connections for audio/video equipment. (Disclosure: In my day job, I work for a company that makes Bluetooth technology for chip designers, but I have no direct financial interest in Bluetooth.)

If everything goes according to plan, it won't be long before you'll be able to add a new peripheral to your PC merely by plopping it down in the same room and installing the usual driver software—no cables required. Your snake-handling days will be over. Sounds great, right?

Alas, even Bluetooth isn't perfect. It's too slow for high-bandwidth applications such as local-area networks and broadband modems. (Another wireless standard, 802.11b Ethernet, is better for those things.) Also, Bluetooth requires a radio transceiver in the PC as well as in the peripherals. Future PCs may have built-in Bluetooth transceivers, but existing PCs will need a Bluetooth PCI card or similar add-on.

Ideally, your OS should have built-in Bluetooth support. Unfortunately, Microsoft recently nixed Bluetooth for the initial release of Windows XP because developers are still ironing out the wrinkles. Security is yet another hot issue: You don't want somebody who's strolling by with a Bluetooth-enabled PDA to tap into your Bluetooth-enabled PC.

It'll take another year or so for the industry to sort out everything. Still, I think Bluetooth stands a good chance of succeeding where similar attempts have failed. It has lots of industry momentum and it's a low-cost feature that everybody needs.



TECH PREVIEW: FLAT PANELS

## 24 Inches of Decadence

**S**amsung's new SyncMaster 240T belongs to a different world—a world of champagne wishes, caviar dreams, and 24 diagonal inches of the most lush (and possibly the most expensive) screen real estate you'll ever have the pleasure to prospect. Let's take a look at the luxury features, hmm?

- 1920x1600 native resolution.
- 24-bit color with no dithering.
- Dual inputs: one traditional analog and one DVI-D.
- Picture-in-picture—perfect for simultaneously running (and swapping between) both input sources.
- And did we mention the 24-inch diagonal screen size, the largest expanse of any desktop LCD we've ever seen? It blew our minds. We trust it will also blow yours.

The unit you see on this page lacks two features that would send it over the edge of supreme wonderfulness—support for HDTV and the ability to run the 1920x1200 resolution when running off the DVI connector. HDTV support should arrive by early summer. The 1920x1200 resolution in digital mode won't happen until a videocard with such capabilities becomes available (the DVI resolution currently tops out at an interpolated 1280x1024).

We'll officially review this chi-chi display with *DisplayMate's* LCD Obstacle Course when the missing features reach fruition. Until that time, just imagine: an LCD that offers the digital screen quality of the Apple Cinema Display, but runs on a PC, offers picture-in-picture, and boasts a larger piece of glass and a higher resolution. Maybe the \$8,000 price tag is justified.

### YOU ASKED!

**Q:** What in tarnation is the Scroll Lock button on my keyboard?

**A:** Scroll Lock has its own key and LED display on the keyboard layout—so it must be important, right? Intel thinks so. The company that's aggressively pushed for the death of the ISA bus and other legacy devices has no plans to eliminate the Scroll Lock key.

"This key is left over from older technology, but Intel isn't driving specifically for its removal. We do feel that many of the keys could be removed from the keyboard to eliminate clutter and allow for new buttons such as a standardized help key. These decisions are left to the PC OEMs and keyboard manufacturers," says Intel spokesman Alec Gefrides.



John Good, a keyboard product engineer with Keytronic, thinks it would be a hassle to remove the thing. "What it boils down to is that nobody has ever complained about it being there," Good says.

The Scroll Lock key is one of the last remnants of the old DOS days. Scroll Lock affects how your cursor keys scroll the screen. Most new applications ignore the key. The lone mainstream app that cares is Microsoft *Excel*. Activate Scroll Lock and you can scroll through a spreadsheet without moving the cursor to the edges first.

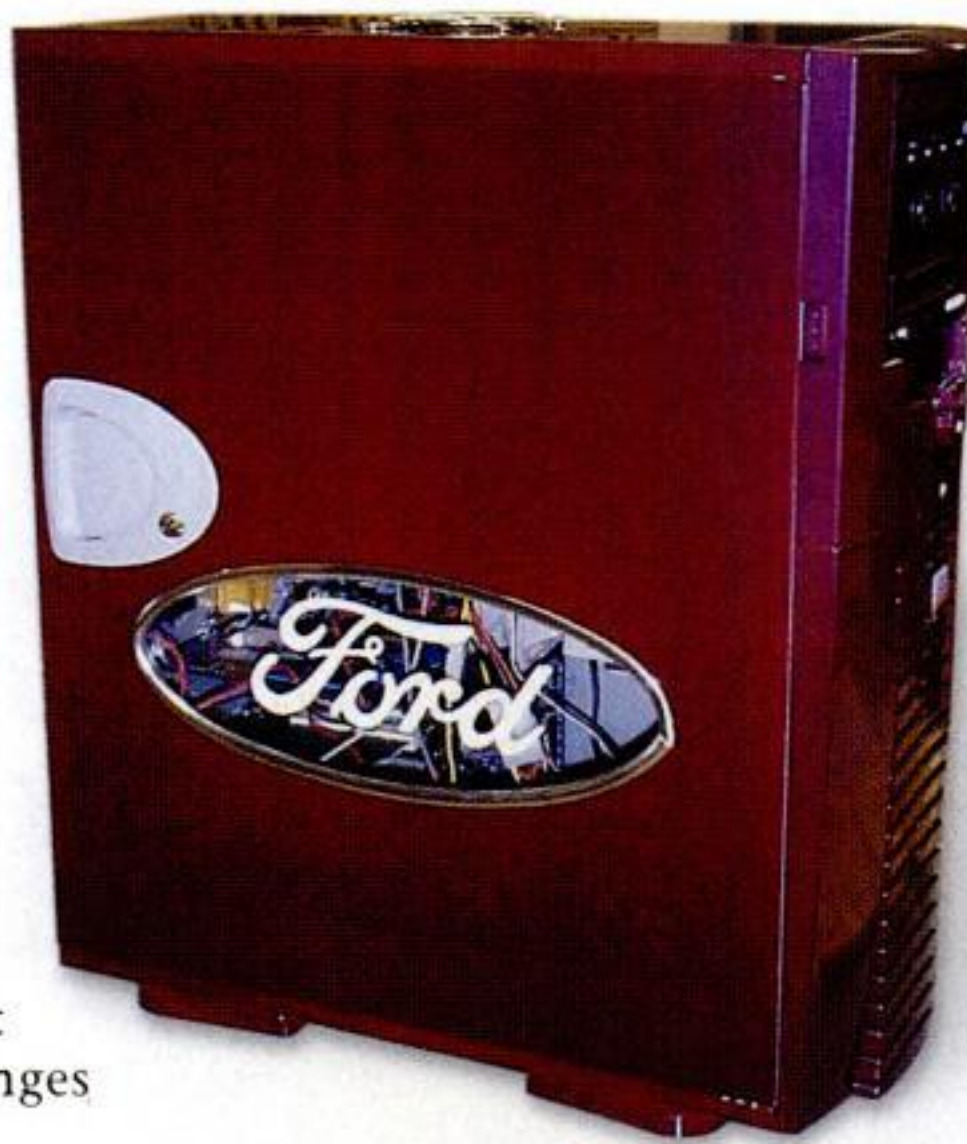


HACK, SOLDER, PAINT

# Rig of the Month

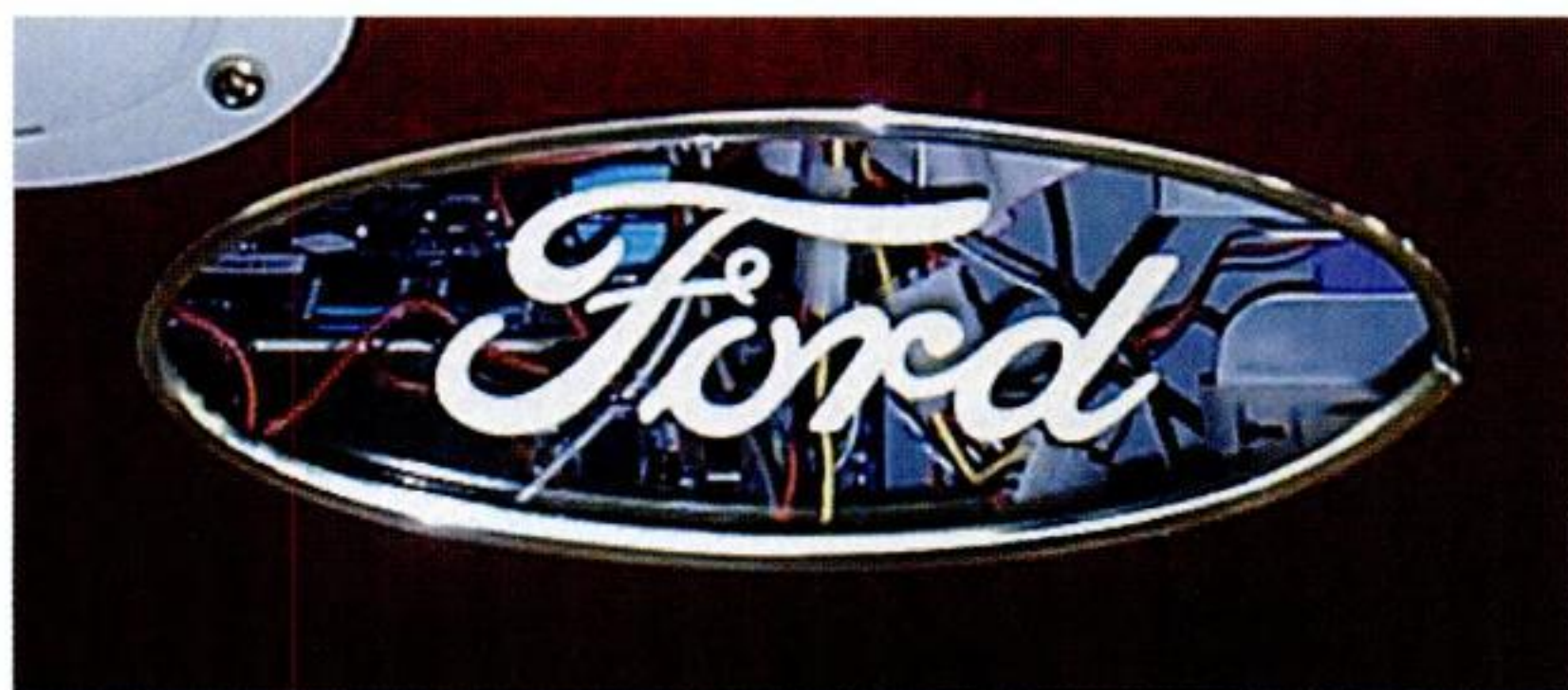
Even before we could finish our own custom PC tour-de-force ["Sub-Zero," May 2001], Jamie Chown of Owen Sound, Ontario sent us pics of his ultimate detailing project. Beginning with an Antec Sx830 case, Jamie used a Dremel tool to cut the oval and a plasma cutter to cut the blowhole on top. After sanding the case with 400-grit sandpaper, he primed the body and used a professional cup gun to apply a basecoat/clearcoat blend of Pearl Red and Pearl Blue Global PPG automotive paint (the case's color actually changes under different light!).

The case was then baked, clear-coated, and shined with G10 buffing compound. The oval has chrome trim, a plexiglass window, and an authentic vinyl Ford logo. The kicker: Blue neon lights are mounted inside the case and cast enough light to illu-



minate the background of the oval. We're impressed. In fact, we daresay we've been schooled.

*If you have a contender for Rig of the Month, e-mail commport@maximumpc.com.*



## Showdown: Web-Based E-Mail

Why use a lousy e-mail service? They're free, so use the best one! We looked at the top web-based e-mail providers and rated each on the amount of space it offers, how many POP3 accounts it supports, and its virus-scanning ability. And with more than a pinch of pessimism, we handicapped how many more months each will survive in the depressing web economy.

|                  | Space | POP3 accounts | Antivirus scanning | Longevity | Our grade |
|------------------|-------|---------------|--------------------|-----------|-----------|
| Yahoo.com        | 6MB   | 3             | Norton Antivirus   | 24 months | B+        |
| Hotmail.com      | 2MB   | 4             | McAfee Antivirus   | forever   | B         |
| Email.com (NBCi) | 5MB   | 5             | None               | 2 months  | C+        |
| Altavista.com    | 4MB   | 5             | None               | 8 months  | C+        |

## GAME THEORY

### Of Games, Galaxies & Gristle

BY THOMAS L. MCDONALD



Welcome, fresh and unspoiled readers joining us in this sleeker, sexier, far more environmentally sensitive *Maximum PC*, now with 9 percent less gristle and hog's anus. (Except in this spot, which is all gristle and hog's anus.)

And to those who read this column regularly, I apologize. For the past four years, all of my reader e-mail has been automatically redirected to a CPA named Earl. So, if you're sitting in a cold, damp basement, shaking a fist at my terrible column picture because I've never responded to your many letters, it's because I never saw any of them. I just figured no one wrote to me. It's rather sad what this says about my self-esteem.

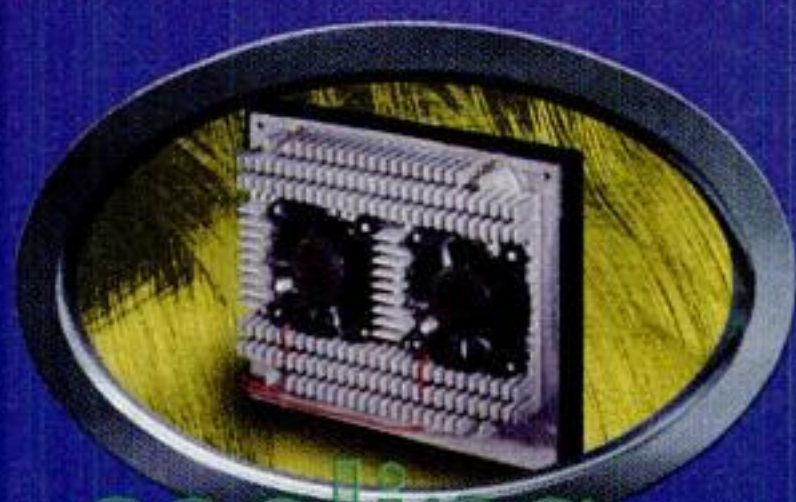
Third, I want to promise that although I now have 60 percent fewer words to work with, I intend to make each one a veritable powerhouse of linguistic aerobics to bring you the very latest news about PC gaming. They gave me this daunting task because I played *Doom II* a couple times.

■ So I get this announcement that Blizzard is developing *Diablo II: Lord of Destruction*, an add-on that will actually feature—get this!—an 800x600 resolution. Whoa, Nelly! Blizzard suddenly realized that gamers who spend \$4,000 on a PC with enough under the hood to manage Texas' power grid might want something with a higher res than *Minefield*. ■ The most interesting story to come out of last month's Game Developers' Conference was not the predictable mainstream awards, but the complete unknowns of the Independent Games Festival. The winning design was *Shattered Galaxies* ([www.nexon.com](http://www.nexon.com)), a massively multiplayer RTS game with some role-playing elements. While some of the nominees are more worthy than others, you should check them all out at [www.igf.com](http://www.igf.com).

■ Ever since I mentioned that *X-COM* is among my top 10 favorite games of all time, readers have wondered what the others are. As with most lists, these things change, but at this point in time the list includes the following: *Civilization II*, *SimCity 2000*, *System Shock*, *Operational Art of War*, *Tank Platoon*, *X-COM*, *Ultima Underworld*, *Jack Nicklaus Golf*, *Unreal*, *Railroad Tycoon*, *TIE Fighter*, *Silent Hunter*, *Aces of the Pacific*, and four or five others I'll remember five minutes after I submit this. Yes, that's more than 10. Hey, if I was good with numbers, I wouldn't have bought stock in Motorola.

*Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.*

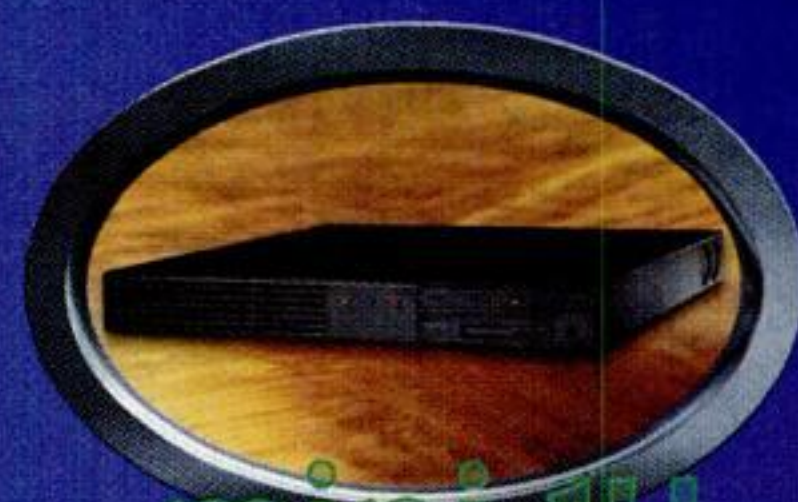




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# Head2Head

A showdown among natural PC competitors

## THIS MONTH: Removable Media

**P**ortable digital devices are constantly learning new tricks, but as their sophistication increases, so does their appetite for storage. Indeed, storing half a workout's worth of music in your MP3 player or just 50 percent of your contacts in your PDA won't cut it. So beefing up your new PC peripherals with removable media is more important than ever.

Removable media should be roomy, compact, and power-efficient, and it shouldn't develop a case of amnesia from the slightest jarring movement. In a perfect world, we'd also be able to use a single media format for all of our portable peripherals, so we could swap memory from device to device at will. Here we compare the most popular media formats, as well as some promising new ones that are itching to give your peripherals a little more breathing room. May the best format win!

—LOGAN DECKER

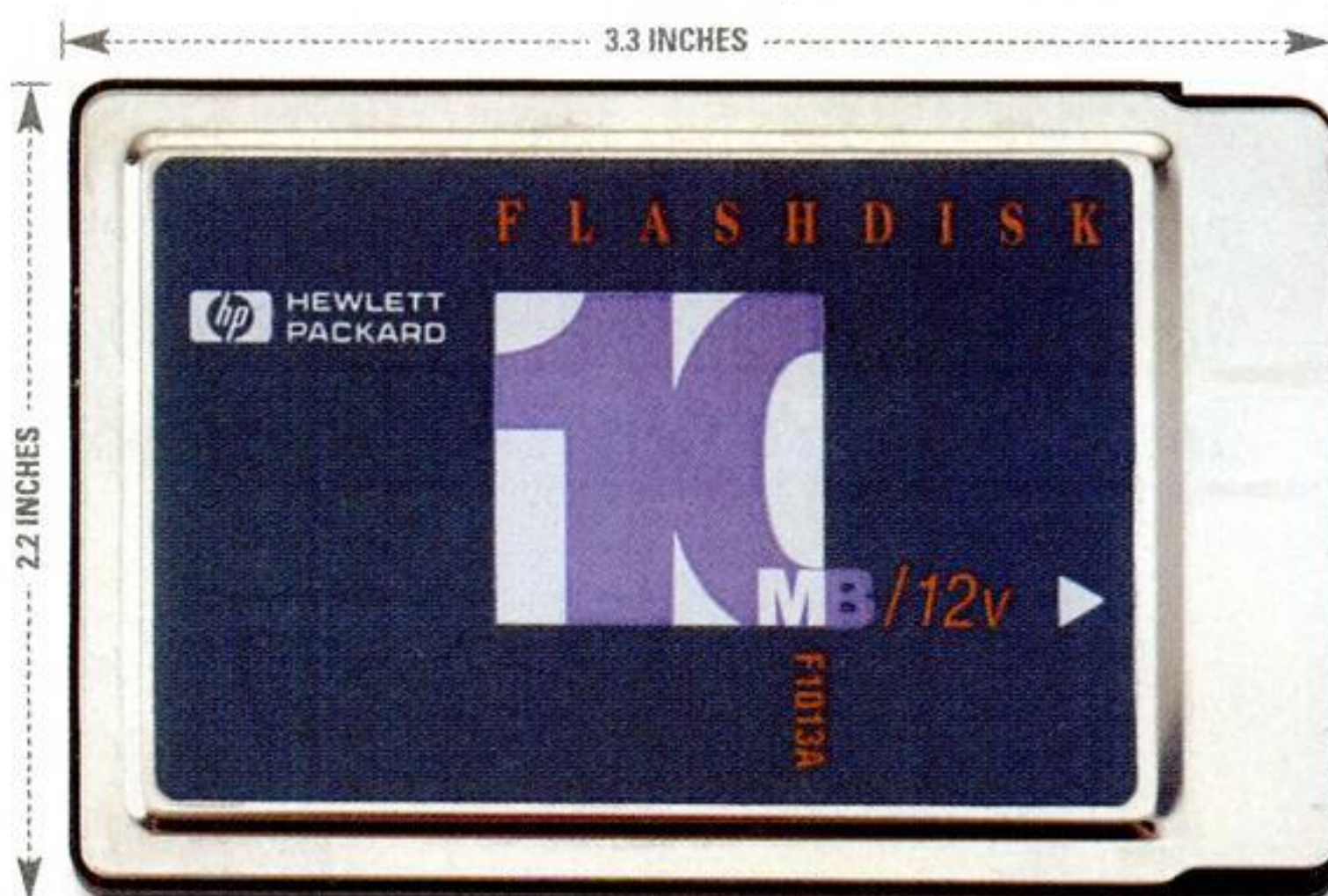
### SmartMedia

**Cost per MB:** \$1.14 **Capacities:** 8MB to 128MB. **Durability:** We wouldn't be inclined to carry these extremely thin cards in our back pockets. **Made by:** Viking, Kingston, Iomega, Lexar. **Used by:** MP3 players, digital cameras. **Why it rocks:** SmartMedia—a.k.a. SSFDC—has survived its awkward abbreviated name to become nearly ubiquitous in MP3 players. **Why it doesn't:** The format is fine for dedicated use in one specific device, but we've had problems swapping cards from one device to another. **Long-term prognosis:** Lffy. MMC seems to be muscling out SmartMedia in the newest digital peripherals. **Verdict:** 7



### MultiMediaCard (MMC)

**Cost per MB:** \$1.30 **Capacities:** 8MB to 64MB (128MB is coming). **Durability:** Sturdy, but not invincible. **Made by:** Viking, Kingston, Sandisk, Lexar. **Used by:** MP3 players, digital cameras, PDAs. **Why it rocks:** About as thick as a credit card, MMC has the smallest formfactor of the bunch. And we love its dainty power requirements. **Why it doesn't:** Larger capacities haven't arrived yet, and the format suffers from somewhat sluggish transfer rates. MMC is also available in a Secure Digital Music Initiative-compliant flavor called SD—and this scares us. **Long-term prognosis:** Bueno. As digital devices get smaller, MMC should pick up steam. Plus, Palm adoption all but guarantees its longevity. **Verdict:** 9



### DataFlash

**Cost per MB:** \$2.03 **Capacities:** 8MB to 512MB. **Durability:** Does it matter? At these prices, you'll end up treating it like fine china anyway. **Made by:** Viking, Kingston. **Used by:** Desktop and portable PCs with a PCMCIA Type II slot. **Why it rocks:** Wide range of storage capacities. **Why it doesn't:** Very expensive. Plus, the gigunda PC card formfactor severely limits its usefulness. **Long-term prognosis:** Moribund. **Verdict:** 4



**DataPlay**

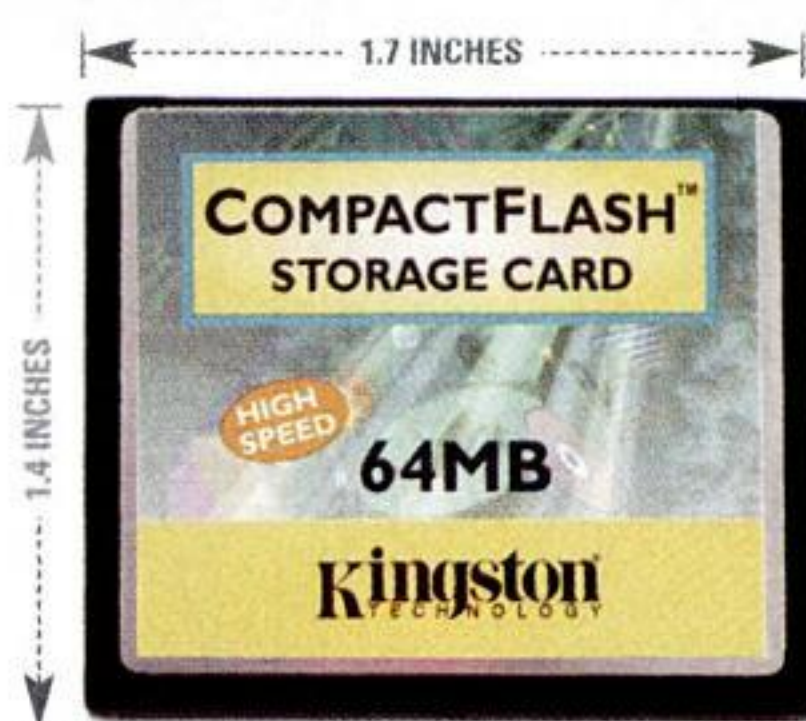
**Cost per MB:** \$0.02 (projected) **Capacities:** 250MB and 500MB. **Durability:** Think "MiniDisc." **Made by:** DataPlay. **Used by:** No one (yet), but Rio MP3 players should be early adopters. **Why it rocks:** Sexy, spacious, and ridiculously inexpensive. And one day you might activate the content of pre-recorded DataPlay discs through a web interface. **Why it doesn't:** It's neither solid-state nor rewritable and won't hit market until late 2001. **Long-term prognosis:** Extremely promising, particularly as a vehicle for commercial music distribution. **Verdict: 7**

**Memory Stick/MagicGate**

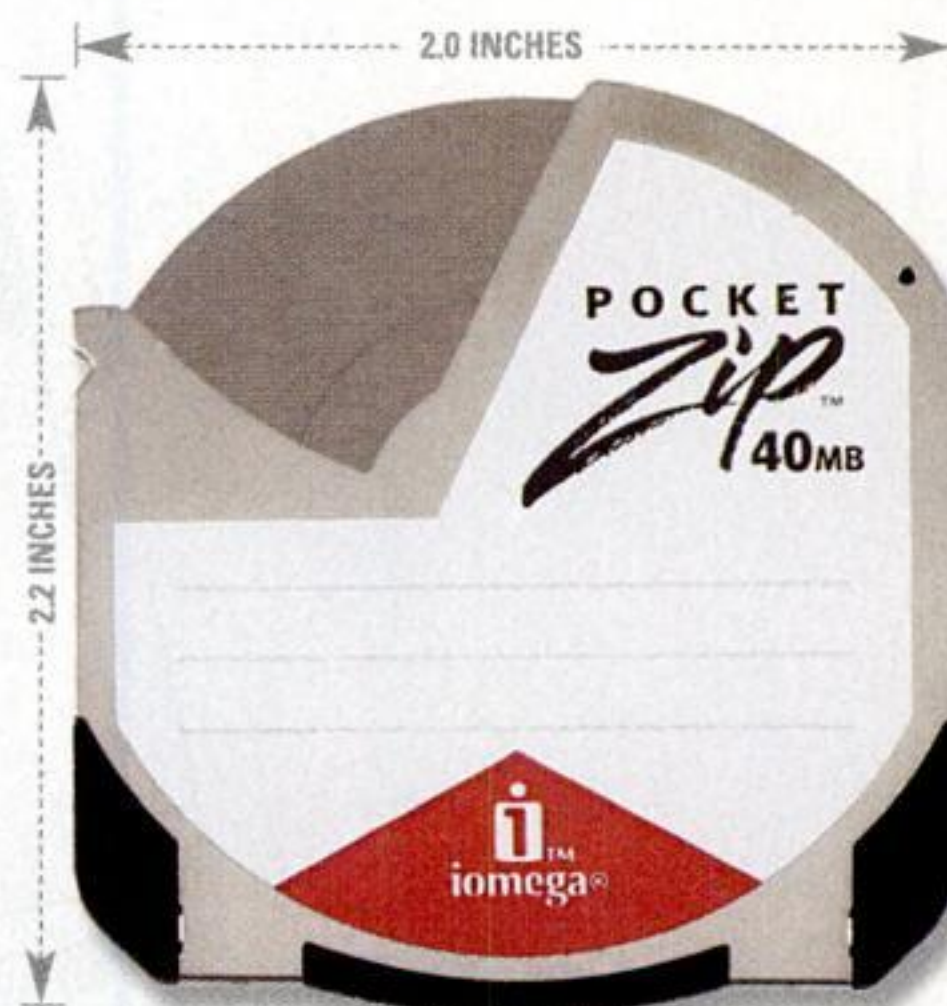
**Cost per MB:** \$1.39 **Capacities:** 4MB to 128MB. **Durability:** It's not exactly brittle, but the plastic casing feels cheap. **Made by:** Sony, Lexar. **Used by:** Sony. **Why it rocks:** Compatible across entire Sony product line. **Why it doesn't:** The technology is used only by Sony products (as of press time). The new "MagicGate" Memory Sticks, designed to be SDMI-compliant, could be bad news. **Long-term prognosis:** Far and away the best removable media for Sony employees. Everyone else should steer clear. **Verdict: 5**

**Microdrive**

**Cost per MB:** \$0.46 **Capacities:** 340MB to 1GB! **Durability:** Despite a "shock-resistant casing," it's still essentially a mini hard drive. **Made by:** IBM, Iomega. **Used by:** PDAs, digital cameras. **Why it rocks:** The Microdrive boasts the highest transfer rates in the roundup. Very inexpensive and the most capacious of all the competitors. It's also compatible with all CompactFlash Type II devices. **Why it doesn't:** Moving parts and bulky size make it less than ideal for MP3 players. **Long-term prognosis:** Good. Pricy flash memory formats can't compete with this wonder for mass portable storage. (Note: The example here appears in a PC Card adapter.) **Verdict: 8**

**CompactFlash (CF)**

**Cost per MB:** \$1.23 **Capacities:** 8MB to 300MB. **Durability:** Very sturdy shell. **Made by:** Viking, Kingston, Iomega, Lexar. **Used by:** Digital cameras, PocketPC PDAs, MP3 players. **Why it rocks:** Benefits from a huge install base across a variety of devices, particularly digital cameras. **Why it doesn't:** Its formfactor has grown a bit, so Type I and Type II CF cards and devices aren't compatible. **Long-term prognosis:** Though long in the tooth, CompactFlash isn't going away anytime soon. **Verdict: 8**

**PocketZip**

**Cost per MB:** \$0.20 **Capacities:** 40MB. **Durability:** Hey, watch your roughhousing! **Made by:** Iomega. **Used by:** Iomega. **Why it rocks:** Formerly known as Click Disk, it's the least expensive currently available format in the roundup. **Why it doesn't:** With only one miserly size available, Iomega clearly intends for users to carry around and swap out a number of disks. We would prefer to not be one of those users. **Long-term prognosis:** It doesn't look like the ugly duckling of removable media is ever going to blossom. **Verdict: 4**

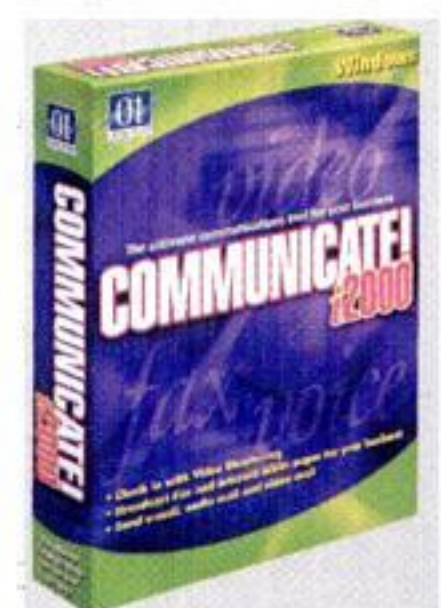




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# Watch Dog



Maximum PC takes a bite out of bad gear

Consumer Advocate

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing [watchdog@maximumpc.com](mailto:watchdog@maximumpc.com). The Dog promises to get to as many letters as possible, but only has four paws to work with.

## Bad Drive, Happy Ending

Who says class-action lawsuits never pay off? The consumers who filed a suit against Philips for its bunk CDD2600 CD-R burner were expecting to receive a similarly dog-bad 2x CD-RW drive as a replacement. But several readers reported much better results. Take, for example, Darrin Mitchell: "I came home to find a brand-new (or, more likely, refurbished) Philips CDRW800-8x4x32 sitting on my front porch. All I did was fill out the online claim form. And they didn't even ask for the piece-of-junk 2600 to be shipped back to them."

It turns out Philips made good on its promise to replace the offending drives with new drives that were equal to, or better than, the CDD2600.

But not all readers were so happy with the 8x Philips drives. Ronald Holder said his initial excitement turned to frustration: "The replacement drive was defective right out of the box!" When he contacted Philips about his warranty, Holder was told the drive wasn't covered. Doh! But even this story has a happy ending: Holder eventually reached someone at Philips who promised to take care of the issue.

A pat on the head goes to Philadelphia attorney Jonathan Shub who took on the Philips case. You may remember Shub as the same attorney who successfully sued Kenwood for problems with its fast but allegedly unreliable 40x40 Zen drive. Shub ([jshub@sheller.com](mailto:jshub@sheller.com)) is becoming renowned for orchestrating suits that have simultaneously benefited consumers and exposed buggy hardware.

## Razer Cuts Its Losses

DEAR DOG: When Razer mice first hit the scene, I was slightly skeptical. But after a trial at the E3 gaming convention, I was hooked. I soon saved up and mail-ordered a Boomslang 2000 gaming mouse. I had one of the best fragging tools in any arsenal—up until about two weeks ago, that is. I'm now experiencing sticky buttons and the wheel has become unresponsive (or it's just stuck).

Razer's web support page goes nowhere, and the message at the support phone number says that

tech support is unavailable and to try back later. I don't want Razer to give me my money back, and I don't want for them to burn in the seventh circle of hell like a lot of people might. I just want the three-year warranty honored and a new Boomslang 2000 mouse.

—Jacob Erickson

THE DOG RESPONDS: Razer, which claimed to make the most responsive gaming mouse on the market, may be as dead as a sidewinder on a Tijuana highway. Razer halted support for its products in late February after the company ran out of cash, says CEO Sandra Goldberg. Although it originally looked like most of its customers would be SOL when it came to warranty and tech support, Goldberg says a last-minute deal with Labtec was struck to extend support and warranty replacements. Labtec

"I don't want Razer to give me my money back, and I don't want for them to burn in the seventh circle of hell like a lot of people might. I just want the three-year warranty honored and a new Boomslang 2000 mouse."

will also continue to stock the Boomslang mouse. Goldberg says the fate of the company's upcoming products is undecided.

"Kärna [Razer's parent company] is riding out the storm, not out of business," the company stated in a press release. "We apologize for any difficulties you may have encountered recently and appreciate your continued support. Kärna is very concerned that current Razer Boomslang customers continue to receive the quality service and support to which they are accustomed."

## Brother, Can You Spare a Keyboard?

DEAR DOG: I'm having problems working on a notebook from DPS Notebook. I know the company went out of business. Do you know where I can get a keyboard for a Green759?

—Jeremy Ness

THE DOG RESPONDS: Your DPS notebook was manufactured by a Taiwan-based company called GVC. If you're looking for a state-side fix, check out SIE CompServ in Hayward, Calif. This company will do out-of-warranty repairs on many GVC notebooks, as well as on notebooks manufactured by Compal, Clevo, and Kapok (which are actual computer companies, not just made-up names). Call SIE CompServ at 510.582.3596 for more information.

## Burn in Hell, Winfire!

DEAR DOG: I recently placed an order with Winfire.com to receive its DSL Power service, which costs a mere \$19.95 a month. However, as I routinely checked my order status, nothing seemed to be happening, and when I recently visited the web site, there was a notice saying that the company was no longer accepting



orders. A few days later the message was changed to say that the service was pulled. What the @#\$% happened? And what will happen to my order and my dad's credit card balance?

—Yu Hoon Yoon

THE DOG RESPONDS: There's no such thing as a free lunch—so why should there be free

**"A few days later the message was changed to say that the service was pulled. What the @#\$% happened?"**

DSL? Winfire's silly "FreeDSL" offer (part of a suite of ridiculously priced plans) was extended during the criminally negligent days of Internet dream peddling. But the wheels finally came off of Winfire's wagon this year when it realized that it couldn't give away a service that typically costs \$40 a month. Welcome to duh.com.



No one needs  
to know you're  
out of the office.



## Pocket PC Go wireless.



**GoAmerica**  
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Wireless email can set you free — free to be mobile and still stay connected. Pocket versions of Microsoft® Outlook®, Word and Excel let you read and edit email and those attached files — you can even send instant messages. Connect a Compaq iPAQ Pocket PC to a Sierra Wireless modem with GoAmerica service and access your essential information in rich color while you're on the go.\*

**Learn how to go wireless at [PocketPC.com](http://PocketPC.com)**

\*Instant messaging requires download of additional software. Modem and wireless service purchased separately. Check with GoAmerica for service availability in your area. Some web site content may be unavailable.

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Steel Enterprise Holdings, Winfire's parent company, says it's looking to unload the service or a portion of it. "In any event, I want to reassure our Winfire customers that we are working to minimize any service interruptions," a rep from Steel Enterprise Holdings said.

In other words: Those who ordered or actually have Winfire service might be left high and dry.

Other readers have told The Dog that their service has been cut off for weeks and they're unable to get new service until Winfire releases the lease of their phone lines (the lines have to be released in order for a DSL service to begin channeling data). Still other consumers have reported that they did indeed get a year's worth of broadband for free—until Winfire went dark.

Yoon, you should pay attention to your father's credit card statement to make sure you aren't billed for the non-service. If you are billed, immediately call your credit card company to dispute the charge.

## OnStream Loses Steam

**DEAR DOG:** I tried reaching tape backup maker OnStream today and got only busy signals. The 800 sales line says the company has ceased operation, although the



"The business climate is not an easy one right now," OnStream CEO Bill Beierwalte told the *Boulder Daily Camera* newspaper after the closure.

web site seems to live on.

—Richard Kaye

**THE DOG RESPONDS:** Once again, more bad news from a hardware vendor. OnStream has sent many employees packing. Affected were workers at its Longmont, Colo., building, as well as some 200 workers at a factory in the Netherlands.

"The business climate is not an easy one right now," OnStream CEO Bill Beierwalte told the *Boulder Daily Camera* newspaper after the company's closure.

OnStream filed for Chapter 7 bankruptcy on March 23, 2001, in the U.S. Bankruptcy Court in Delaware. While the U.S. operations seem

to have vanished, the European arm of OnStream is painting a rosier picture: "...the closure of the American office will have minimal effect on the supply of existing and new ADR tape drives. OnStream expects to resume its business activities within a few weeks." If funding comes, through, Euro OnStream expects to be back online by the time you read this. Tapes for the drives will also continue to be offered by Verbatim.

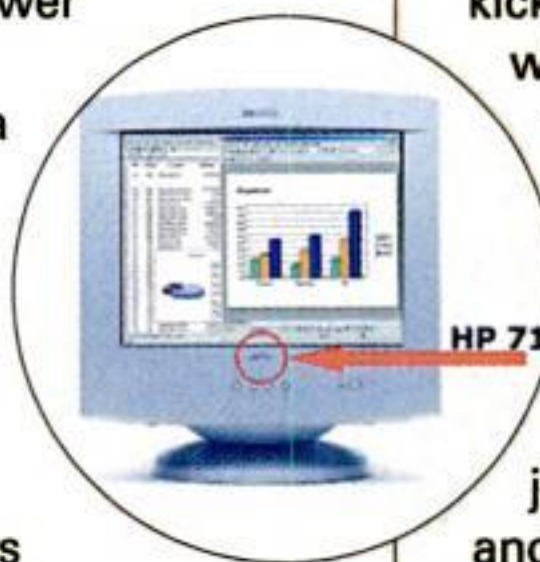
It's good to hear that OnStream may not die completely, but The Dog recommends that you wait until a little more light is shed on the situation before investing heavily in OnStream hardware. ■

## HP Monitors: Real Shockers!

Hewlett-Packard is warning consumers that some of its 17-inch HP71 monitors may impart a slight shock if touched on the wrong spot. If your monitor is affected, HP says it will replace the unit. The defect is found in only the D8903A version of the monitor, which began shipping in July 2000 in the U.S., Canada, Argentina, Chile, Colombia, the Dominican Republic, Mexico, Peru, Uruguay, and Venezuela. HP says only 0.01 percent of the HP71 monitors are flawed. The shock occurs when an unlucky rube touches a "limited area on the top of a defective monitor." The power of the discharge is slight, but there's still a remote chance of it causing injury, HP says.

To check your monitor, first look at the packaging that it came in. If there's a small blue sticker on the carton, the monitor is safe. If there's no blue sticker, look at the front

bezel. If the bezel does *not* say "HP71" on it, the monitor has a clean bill of health. If it *does* say HP71, look on the back of the monitor to see if it's a model D8903A. If it's *not* a D8903A, the monitor is fine. If it is a D8903A, look at the connector where the power cord plugs into the monitor. If you find a sticker that says "QA Check," the monitor is safe. *All other monitors could have the defect.* U.S. and Canadian consumers should call HP at 800.428.2446 for a replacement monitor. People in Latin America should contact the store where they purchased the monitor. For more details visit: [www.hp.com/go/monitor\\_inspection\\_program/](http://www.hp.com/go/monitor_inspection_program/).



## This Just In: Smart and Friendly Still Dead

Still trying to figure out which company made the essential hardware inside your Smart and Friendly CD-R/RW drive? S&F may have gone bust, but many of its drives are still kicking and can be patched with free software downloads from the optical drive companies that manufactured the original hardware.

Smart and Friendly's fastest drive, the S&F Rocket Mach 12, is really just a Sanyo CRD-BP2. Smart and Friendly's CD Rocket 8x20 is a Sanyo CRD-R800S, and the CD Rocket RW 8x20 is a Plextor PX-R8220. If you have an older Smart and Friendly drive and you're curious about who manufactured it, hit [www.cdmediaworld.com/hardware/cdrom/cd\\_cd-writer\\_tech.shtml](http://www.cdmediaworld.com/hardware/cdrom/cd_cd-writer_tech.shtml). The web site has compiled a lengthy list of drive manufacturers. But remember, you're on your own when it comes to risking a software fix.

## Iwill Recalls Some Mobos

Iwill has issued an "engineering change notice" for the 1.2 version of its KK266 motherboards. The boards have problems with certain multiplier settings on CPUs. Iwill is offering to replace the affected boards. For more information on the problem, and to download a return merchandise authorization form, visit [www.iwillusa.com](http://www.iwillusa.com).



# MASTERING

PICKING  
THE RIGHT  
ONE  
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PALM vs.  
POCKET PC  
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KILLER  
PDA APPS  
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ACCES-  
SORIES  
PAGE 32

**It shuttles around your most crucial data—it's your PC away from home. Learn how to choose and use the perfect PDA.**

**Y**our to-do list. Your schedule. Stock quotes. News headlines. A dictionary. A calculator. A game of checkers or a crossword puzzle. Fifteen minutes at your PC each morning gives you access to them all. But what about when you power down and head out the door? Can you really afford to leave it all behind?

You can't—and with a personal digital assistant (PDA), you don't have to. No PC is an island, and unlike early PDAs that tried (and failed) to replace your desktop PC, modern PDAs function as true extensions of your desktop computer. In many ways, they echo the PC platform, packing more computing power than the first astronauts used to get to the moon. Not only can PDAs host your schedule and address book, they can also give you wireless access to the Internet, take digital pictures, and—in some cases—replace the need for a notebook computer.

#### **BRAVE NEW PDAs**

If you dabbled with the early clamshell PDAs, suffering through un-backlit screens that only displayed two lines of text at a time, you'll be pleasantly

surprised by today's models. From crisp, full-color screens to stereo sound and video capabilities, the functions now available on these devices rival those offered by some notebooks.

More importantly, today's PDAs come fully prepared to synchronize information with your PC. If your PDA gets lost or stolen, your data remains safely backed up on your PC. The same can't be said of *any* paper system—and no looseleaf notebook or paper calendar does double-duty as a wireless phone, GPS unit, and e-mail depository. You may not need all those features, but if you buy a PDA today, they'll be yours.

#### **A SHORT HISTORY**

A decade ago, PDAs were mostly clamshell units—think miniaturized notebook computers, plastic-encased with an attached cover—equipped with tiny, two-line LCD screens and miniscule keyboards. They didn't hook up to your PC, offered only minimal functionality, and weren't programmable.

But all that changed in 1996 with the arrival of the Palm Pilot 1000. Its CPU was pathetically slow by today's PDA standards and it only had 128KB of memory, but instead of forcing users to enter data via Rice Krispie-size keyboard keys, the Pilot used the pen-based Graffiti system (see the Data Input section on page 26 for details on how Graffiti works). The Pilot's easy means of entering data, intuitive interface, and ability to synchronize data with a PC made it a smash hit. The Palm was small and light enough to slip into a pocket or purse,

and it didn't pretend to replace your desktop machine. Rather, the Palm was designed to function as an extension of your PC, shuttling data to and from it as needed. And, unlike other proprietary clamshell devices, the Palm was designed to be used while standing.

It didn't take long for Microsoft to recognize the PDA territory as one in which it wanted a stake. But the company's Handheld PCs, using its proprietary Windows CE operating system, were almost universally shunned by consumers, who complained of complexity, bugs, and sluggishness. A second attempt, the Palm PC, copied the shape of the successful Palm device but was also shunned. In 2000, Microsoft finally hit upon the Pocket PC version of the OS released last year. Though it still has a complicated interface, Pocket PC looks to have a bright future and may one day seriously compete with Palm.

#### **WHAT'S OUT THERE NOW**

Walk into a Best Buy or CompUSA and you'll face a daunting lineup of modern PDAs. Don't be confused by the breadth of colors, screens, and shapes. On the following pages, we'll walk you through the essential elements of any good PDA, compare Palm and Pocket PC devices feature by feature, show a sampling of the many accessories available for PDAs, and offer a look at software we like best. We'll also explain the current lay of the PDA land: what companies are offering what devices, and what lies ahead on the PDA landscape.

***"If your PDA gets lost or stolen, your data remains safely backed up on your PC. The same can't be said of any paper system..."***

**[CONTINUED ON PAGE 32]**



# YOUR PDA

By Gordon Mah Ung

PHOTOGRAPHY BY ARNOLD TIOSEJO

**Form factor:** PDAs are growing sleeker and slimmer with each new iteration. The Visor Edge, less than 5/8-inch thick, is the slimmest PDA ever.

**Synching:** The modern PDA's most distinctive feature: It works *with* your PC instead of trying to *replace* it. Today's PDAs are designed to synchronize data with your desktop computer.

**Screen:** Gone are the days of the muddy, illegible grayscale display. Today's grayscale screens are perfectly visible in bright sunlight—and a new breed of color displays are bringing a wave of brilliance to PDAs.

**Input:** There are a variety of ways to get data onto a PDA, but every device worth its salt includes a stylus that's used to "write" characters on the screen.

**Handspring  
Visor Edge, \$400**



# PICKING THE

There's a PDA out there with your name on it, but no matter which model you choose, there

## SCREEN



Early PDA screens either featured dim, grayscale screens that were illegible in low light, or passive-matrix LCDs that simply rendered colors poorly. Today's 16-bit, active-matrix TFT color screens render colors brilliantly, but grayscale units—now viewable in even the dimmest light—remain the more popular (and less expensive) choice. Found on such popular models as the Palm Vx and the recently released Handspring Visor Edge and Palm M505, the latest grayscale screens are covered in a thin film layer that enhances contrast and makes them easy to read even under the poorest indirect fluorescent lighting.

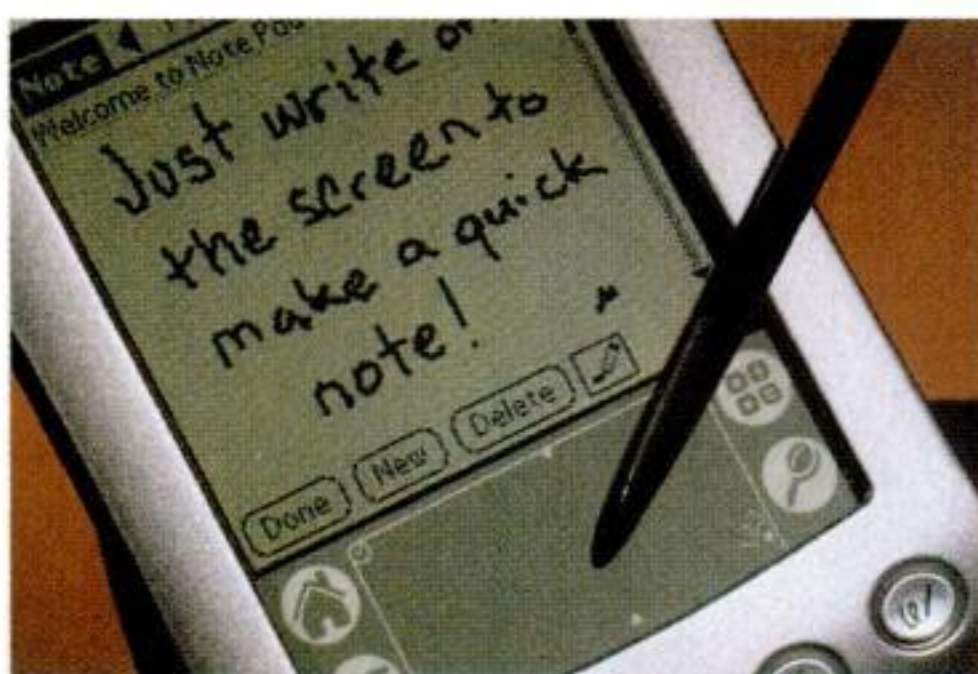
Grayscale screens have two distinct advantages over their more vibrant cousins: They don't require tiny fluorescent tubes (which quickly drain the batteries on devices with color screens), and their visibility actually *improves* in the bright sunlight that causes most LCD-based color screens to look washed out.

Recently, Compaq's iPaq and Palm's M505 heralded the introduction of side-lit reflective color screens. Like grayscale screens, they rely on reflected light to illuminate characters, but they also have a fluorescent tube that can be activated when no external light is available (and turned off to save battery power when not in use). These screens are legible in bright sunlight, but produce results that are less brilliant overall than those of a backlit LCD.

In general, PDAs using the Pocket PC operating system boast screens with higher resolutions and more real estate than those found on Palm OS devices. Palm and Handspring devices offer only 160x160 resolution; Pocket PC PDAs feature 320x240 resolution.

**OUR PICK:** Unless brilliant color is a must, the side-lit screens found on the iPaq and the M505 offer the best of both worlds.

## INPUT



PDAs are graced with a variety of buttons and wheels, and occasionally with miniature keyboards, but one thing just about all PDAs have in common is the stylus. Though maneuvering the pen-like device can take some getting used to, it's by far the easiest way to enter information into a device that you'll use in many places other than at your desk.

In much the same way you use a pencil on paper, a stylus is used to "write" on a device's screen in characters the PDA can understand and convert into letters, numbers, etc. Palm devices favor Graffiti, a form of shorthand that requires you to write characters that are very close to—but not quite the same as—Arabic letters. Graffiti is easy to learn—about 20 minutes of practice does the trick—and mimics the regular alphabet closely enough to make it quickly usable. Our biggest complaint is that your screen-scrawling is invisible—the screen displays no visible outline of the characters you're entering, making it tough to verify what you're writing.

Pocket PC-based devices use a similar input method called Character Recognizer, which boasts one notable advantage in that it does offer "echoing," a display of your "writing" as you scribble. Make no mistake—Character Recognizer doesn't offer "handwriting recognition," which we consider to be the ideal method of inputting data. So far, elegant, trouble-free handwriting recognition is the ghost all PDA manufacturers are still chasing.

**OUR PICK:** If a PDA doesn't offer a stylus, it's not even on our radar—trying to tap out words on a tiny keyboard can be a true exercise in frustration. The Graffiti vs. Character Recognizer debate isn't a make-or-break deal in either direction, since an echoing feature can be added to the Palm via third-party software.

## SOFTWARE SUPPORT



When considering the software support of a PDA, two factors figure in: what applications come standard with the device and what applications can be added to it.

When it comes to built-in applications, Pocket PC devices make a strong showing. In addition to fairly advanced calendar and address-book applications, they allow you to work on full-fledged *Word* and *Excel* files—and they're ready to handle those documents right out of the box. Compaq's iPaq is even prepared to play MP3 files and videos the first time you fire it up. And Pocket PC PDAs include a mini version of Microsoft's *Internet Explorer*.

One vexing problem is that most Pocket PC software requires you to install a version of the application that's optimized to work with your device's CPU—but different manufacturers use different CPUs in their devices. Some applications can detect the CPU and install the correct version, but those that can't, rely on you to find out which CPU is driving your device.

Palm devices traditionally have weak out-of-box offerings, but since the same CPU is used across all Palm OS devices, installing applications on them is a simple affair. And because Palm has been less-than-possessive with its secret sauce, a fanatical army of developers has pumped out third-party software for the past few years, much of it available for download for almost nothing. The result is a decadent abundance of applications designed to do just about anything, from opening a *File Maker* database on your Palm device to keeping track of your wine-tasting preferences.

**OUR PICK:** We like the Pocket PC's bundled applications, but have to give the nod to Palm OS devices for strong third-party support and ease of installation.



# RIGHT ONE

are some fundamental features every PDA should offer. Here's our outline of the essentials.

## FORMFACTOR



You *will* care about the shape and size of your PDA. Boxy or curvy, heavy or feather-light—the formfactor affects how you use the PDA.

Naturally, a device's size and weight are to some degree determined by the amount of firepower it's packing—more memory and a fancier screen often translate into a heftier model that may not fit comfortably in your shirt pocket. Most Pocket PC devices fall into this category. On the other hand, slimmer, sleeker models usually offer fewer bells and whistles (and almost always have less eye-popping screens).

It's also worth taking a tour of a device's buttons and controls. Most Palm devices are graced with a series of four navigation buttons, but Sony's Clie and Hewlett-Packard's Pocket PC Jornada 525 feature a scroll wheel that lets you page through your contact list with one hand. (People with especially big or small mitts may find certain devices easier to use.) And if you know you'll be carrying your PDA in a crowded briefcase or satchel, you may want to avoid a device such as the Jornada, which has an easily bumped external button that activates its voice-recording function.

The smallest PDA currently available is Handspring's Visor Edge—it's smaller than any other PDA, Palm or Pocket PC. In fact, most Pocket PC units, with their heftier processors and larger screens, are simply too bulky to fit anywhere but in your bag. Compaq's iPaq is close to closing that size gap with a formfactor similar to the Palm Illxe's at less than 5/8-inch thick, but it still doesn't compare to the Visor Edge or even the Palm Vx.

**OUR PICK:** Palm OS devices are, bar none, smaller and lighter than Pocket PC devices. Nearly all Palm models are svelte enough to fit into a coat pocket or purse.

## SYNCHING WITH YOUR PC



Every PDA worth considering has one important feature: a symbiotic relationship with your PC. Data is swapped and synchronized between the two, so if your PDA gets lost or takes a swim in a urinal, you're out some cash, but your vital data is still sitting safely on your computer. Most PDAs are also equipped with features that allow them to swap information with other devices—printers, cell phones, and other PDAs.

The most popular method of synching between a PDA and a PC requires a nine-pin serial connector—you'll find them on almost every Palm device. Though the serial port is a reliable connection and one that's been around long enough to ensure that you can sync your device with almost any PC, it limits your synching to a maximum transfer speed of 115Kbps. As larger amounts of data—in the form of databases and graphics, for example—are being pushed to PDAs, synching speed has become a consideration of larger import. Almost all Pocket PC units and all Handspring Visors employ the much speedier USB connection.

Though less swift than USB, infrared does offer a convenient—and wireless—way to synchronize with an IrDA-equipped notebook when you're on the road, or to connect to the Internet through an IrDA-enabled cell phone. It does not, however, provide a reasonable way to transfer large chunks of data between your PDA and another device—in part because few desktop PCs are IrDA-enabled, and in part because the transfer scheme, while viable, is less than speedy. All modern Pocket PC devices and Palm OS devices feature infrared.

**OUR PICK:** If it's available on the device you like best—and if you plan to use your PDA for carrying around large parcels of data—USB is your best synching option.

## MEMORY/EXPANSION



Your humble PDA can never have too much memory.

The newest slew of Palm devices are the first of their kind to include a memory expansion slot (Secure Digital, or SD, cards with capacities of up to 128MB can be added at will), but no Palm is available with more than 8MB of onboard memory. That's not much, but it's enough to handle a fairly meaty collection of Palm apps, most of which weigh in at around 20K.

To handle its big applications, a Pocket PC device works best with 32MB onboard—but 32MB models, like Compaq's iPaq, are budget busters. Consider a 16MB device like HP's Jornada 525, which can access applications stored on Compact Flash cards.

Whether you need to add accessories to your PDA will depend on how you plan to use it. A variety of add-on Palm accessories—keyboards, modems, mini GPSs—have made their way onto the market, but up until now, they've been tacked rather inelegantly onto the PDAs via the synching port. The SD expansion slot in Palm's M series ostensibly makes add-ons fit better, but SD devices won't be on the market for many, many months. Springboard modules provide expansion opportunities for all Handspring PDAs. They include cameras, MP3 players, and memory cards that only slightly disturb the PDA's sleek, compact shape.

Almost every Pocket PC allows for expansion possibilities via a Compact Flash slot, but Pocket PC accessories are few and far between. (For a closer look at PDA accessories, see pages 32-33.)

**OUR PICK:** The SD standard is in its infancy, and Springboard modules are still a scarcity. For long-term memory and expansion support, Pocket PC devices equipped with Compact Flash slots are the way to go.



# PALM vs. POCKET PC

We detail the definitive differences between the bitterest of PDA rivals.

## Palm M505

PALM INC. (We will review the M505 when Palm lets us have one for an extended period.)

PRICE: \$450

**T**he M505 features a color screen that far outperforms the streaky display of its color sibling, the IIIc. It also heralds the arrival of memory expansion in a Palm device, via postage-size memory cards that offer space to store tons of data—including applications.

**Battery life:** The M505 features lithium polymer batteries—a form of moldable battery cell. Like its earlier brethren, the M505 is stingier with energy than a California power plant.

**WINNER: Palm**

**Expansion:** The M505's SD slot promises to host a bevy of peripherals, but Pocket PC's CF and PC Card add-ons, though scarce, still kick Palm's shiny ass. An almost-worthy opponent exists in Handspring's Springboard modules. Too bad they're limited to use in Handspring devices.

**WINNER: Pocket PC**

**Screen:** Thanks to its reflective mode, the M505 is the first Palm with a color screen that's legible in sunlight, and its 16-bit color depth is a vast improvement over the 256-color depth of the IIIc. It's actually the same technology that graces the iPaq—but with a lower resolution of a measly 160x160.

**WINNER: Pocket PC**

**Interface:** Intuitive and customizable, the Palm's icon- and menu-based interface is incredibly simple to use. Making your way between applications is effortless—especially compared to Pocket PC's convoluted navigation scheme.

**WINNER: Palm**

**Memory:** With the M500 series, Palm added a Secure Digital slot for snapping in 64MB or 128MB of usable memory. Considering the Palm's miserly use of RAM and tiny, tiny apps, we lean toward Palm—but it's essentially a tie.

**WINNER: Tie**

**CPU:** These days, you may find yourself viewing PDF files, editing faxes, and checking your e-mail with your PDA. The Palm's 33MHz CPU is quickly becoming too sluggish for our tastes.

**WINNER: Pocket PC**





**B**uttons, bells, colors, sounds, graphics, batteries. How is it that so many bits and pieces can be stuffed into a PDA's little package? And if you were to hold a different PDA in each hand, how would you really tell the difference between Palm OS- and Pocket PC-based devices?

Traditionally, Palm-based PDAs have subscribed to a mantra that says battery life is more important than features. It's a strategy that has more or less paid off in spades: Of all PDAs purchased by con-

sumers in the past four months, eight out of 10 used the Palm OS. Though Pocket PC promises far more in the way of features, even the most advanced Pocket PC device can't hold a candle to a Palm-based PDA's run time.

Does this mean Pocket PC devices are doomed to obsolescence? Hardly. If anything, the decision to focus on battery life over power and features may ultimately mean the undoing of the Palm empire. For a frequent business traveler who doesn't want to lug a notebook com-

puter through airports, a Pocket PC device, with its close ties to familiar Windows applications, could be the ultimate PDA. These little wonders simply need to overcome their gluttonous memory and power requirements.

So how do Palm- and Pocket PC-based devices differ on the hardware level? We took Palm's best and brightest unit, the new M505, and pitted it against Compaq's red-hot iPaq 3650 in a feature-by-feature comparison to see which platform really offers the best PDA possibilities.

## Compaq iPaq 3650 COMPAQ (Reviewed in the December 2000 issue.)

PRICE: \$500

**T**his could be the unit that makes Pocket PC. Its relatively svelte size (for a Pocket PC), color screen, stereo output, fast CPU, and curved shape have made it the darling of the Pocket-PC world.

**Expansion:** There's no expansion slot in the iPaq (Compaq opted for add-on jackets that allow customized expansion options), but most Pocket PCs are equipped with a Compact Flash slot that can handle an assortment of add-ons.

**WINNER: Pocket PC**

**Screen:** The iPaq's side-lit, reflective screen is more or less the same screen found on the M505, but the iPaq's higher resolution of 320x240 delivers more detail to the icons and text.

**WINNER: Pocket PC**

**Interface:** Unlike Palm's one-application-at-a-time scheme, Pocket PC allows multiple apps to be open at once—but makes it very difficult to close or navigate between them.

**WINNER: Palm**

**Battery life:** The iPaq pioneered the use of advanced lithium polymer batteries. Unfortunately, the unit's powerful processor and payload of RAM take a toll on battery life.

**WINNER: Palm**

**Memory:** The 3650 boasts 32MB of onboard memory, but the inefficiencies of its OS nullify many of its RAM advantages. All Pocket PC devices offer memory expansion capabilities—but so does the latest round of Palms.

**WINNER: Tie**

**CPU:** Granted, a speedy processor is a necessity for a device that's running junior versions of Microsoft Office apps, but the iPaq's 206MHz StrongArm CPU is so much faster than the Palm's 33MHz mini-proc, it makes the Palm silicon seem almost silly.

**WINNER: Pocket PC**





# ESSENTIAL

Use your PDA as your calendar, your dictionary, and your universal remote

## Scheduling

|                           |       |                   |       |
|---------------------------|-------|-------------------|-------|
| Tue 4/17 (2)              |       | Wed 4/18 (1)      |       |
| 2P Haircut-Kena           |       | 2P Tribes 2 match |       |
| 2P Benchmark now pc       |       |                   |       |
| Thu 4/19 (2)              |       | Fri 4/20 (2)      |       |
| 4P Intel meeting          |       | Bagel Day         |       |
| 6:30P Call Janet you c... |       | 2P AMD meeting    |       |
| Sat 4/21 (1)              |       | Sun 4/22          |       |
| TNT run 15 miles          |       |                   |       |
| Week                      | Month | Agenda            | Tasks |
| Apr 16                    |       |                   |       |

**Pocket Informant** changes the look of appointment data on a Pocket PC.

View your schedule in seven different ways (daily, weekly, weekly-agenda, monthly, quarterly, yearly, and events); customize your Address Book, To Do List, or Memo Pad windows; and integrate custom fonts and alarms with **DateBk4**. This massively featured scheduling program includes full support for color, graphical icons, and a host of other tweakable settings. Best of all? It uses the databases that already exist on your Palm, so you don't have to re-enter your contact or scheduling information. Pimlico Software, Inc, \$25, [www.pimlicoftware.com](http://www.pimlicoftware.com)

Pocket PC's stock scheduling program is damned good, but **Pocket Informant** is better, providing you with the power to tweak the colors of the background and display text, and to display additional details in your contact information. This application doesn't necessarily add features to your scheduling program, but it does allow you to customize nearly all aspects of it. And it uses the data already in your Pocket PC.

Webbs, \$20, [www.pocketinformant.com](http://www.pocketinformant.com)

## Productivity

Dear Josh:  
I heard, I hope all is well down at *Motorcyclist* magazine. A lot of readers miss your wit and have written to say they miss you. Although we also miss you here at *Maximum PC*, I wanted to know if **knew** where the 1.3GHz T-bird CPU went. I had it on my bench when you were cleaning out but now it's gone. I wondered if you might have accidentally boxed it up.

Pocket PC's **Pocket Word** is almost as full-featured as the desktop version.

Palm's built-in notepad doesn't allow you to create documents larger than a few hundred words, so our favorite text processor (we think "word processor" is too strong a phrase for the platform) is Cutting Edge Software's **QuickWord 5.0**, which allows you to create and edit Microsoft *Word* documents on your Palm. **QuickWord** includes a desktop app that handles syncing of your *Word* files with your PDA, and support for the Sony Clie's thumb wheel and the Stowaway keyboard. Cutting Edge Software, Inc, \$20, [www.cesinc.com](http://www.cesinc.com)

Since Pocket PC devices come standard with a mini version of Microsoft *Word*, there's no reason to add a word processor. But the orthographically challenged will appreciate Phatware's **HPC Spell**, which lets you spell-check documents on your Pocket PC just as you would on your desktop. It includes such grown-up features as a user-customizable dictionary that contains a whopping 90,000 words. **HPC Spell** also allows you to fire off e-mail from within the program, avoiding those embarrassing typos that cause hissy fits in all your friends who were English majors. Phatware, \$20, [www.phatware.com](http://www.phatware.com)

## Games

| Ghetto                                                  |         |         |         |
|---------------------------------------------------------|---------|---------|---------|
| 6                                                       | Acid    | \$3769  | Cash    |
| 0                                                       | Cocaine | \$22506 | \$1097  |
| 15                                                      | Ecstasy | None    | Debt    |
| 0                                                       | PCP     | \$3398  | \$12540 |
| News Flash                                              |         |         |         |
| The cops just did a big Weed bust! Prices are sky-high! |         |         |         |

**Dope Wars** for the Palm is low on flash but high on engaging gameplay.

Face it: The Palm wasn't designed to host "action" games. It is, however, an excellent platform for such "thinking" games as chess, Othello, and checkers—all of which can get really, really boring after a while. For a 21st-century "thinking" game, just say yes to **Dope Wars**, the drug-slugging simulator that could have inspired the movie *Traffic*. It's like building a business: You use your wits and instincts to control the market, enhance your vertical, and increase your return on investment. The simple interface and clever scenes make it truly addictive. Matt Lee, free, [www.download.com](http://www.download.com)

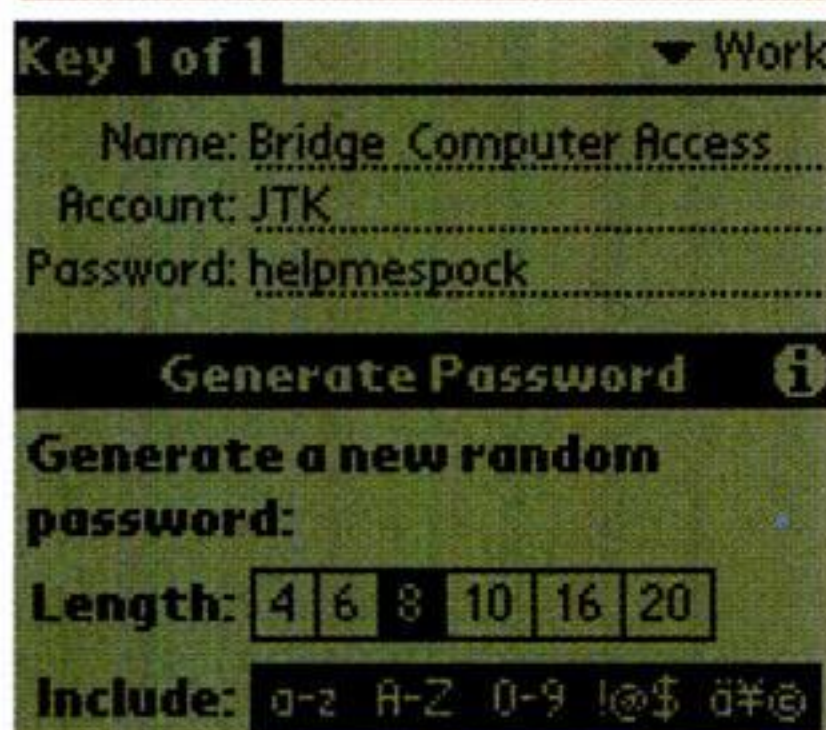
One arena in which the Pocket PC whips the Palm's under-powered hide is gaming. Look no further than **PocketQuake**. It's a pain to install, but this ported version of id's famous first-person shooter takes full advantage of the Pocket PC platform's superior audio and graphics capabilities. It's somewhat difficult to learn the controls, but the overall results are jaw-dropping. PocketMatrix, free, [www.pocketmatrix.com/](http://www.pocketmatrix.com/)



# SOFTWARE

control—there's software that lets you do it all. We recommend our favorites.

## Utilities



**GNU Keyring** protects whatever delicate data your Palm is storing.

Older Palm models will allow just a few hundred characters to be selected and copied. **MultiClipHack**, a plug-in for **HackMaster**, provides up to eight different clipboards that can hold up to 32KB of data apiece.

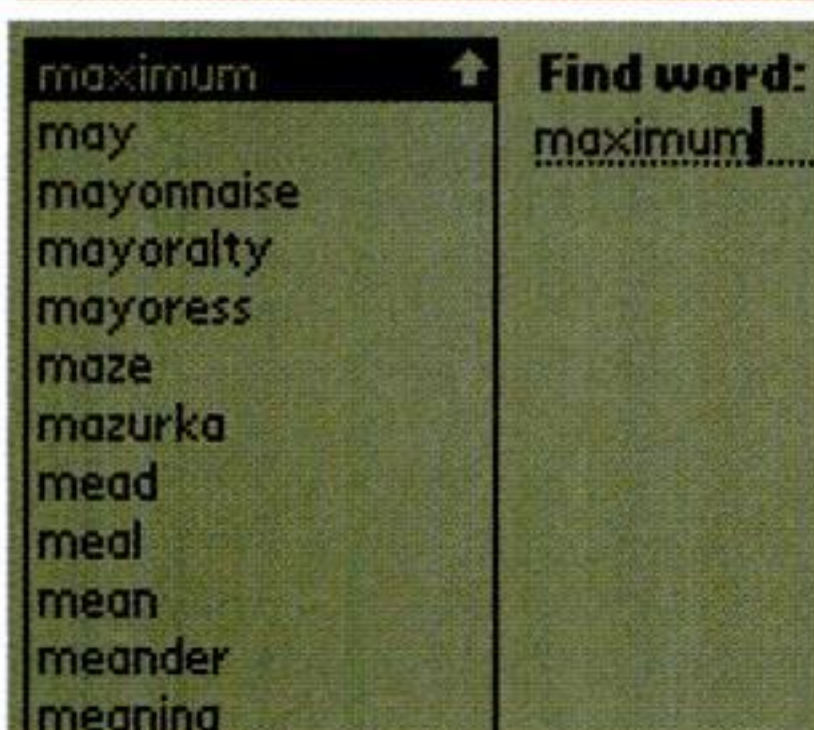
Because even a PDA—and particularly a Palm—is susceptible to security leaks, we recommend storing sensitive information such as credit-card numbers and passwords in **GNU Keyring**. It encrypts your data and can even generate random passwords. We feel safer already.

Martin Pool, free, <http://gnukeyring.sourceforge.net>; Katsuhiko Endo, \$5, [www.palmgear.com](http://www.palmgear.com)

Our main gripe with the Pocket PC OS is that it's almost impossible to shut down an application when you're through using it—which means it hangs around eating up memory. **GigaBar** makes even the clunky Pocket PC shape up. Once installed, it allows you to switch between applications or shut them down by clicking on their icons in the task bar. Even better, **GigaBar** lets you easily navigate between applications via a menu bar.

Thumbs Up Software, free, [www.thumbsupsoft.com](http://www.thumbsupsoft.com)

## Reference



**Noah Pro** packs 122,000 words into just 5MB of your Palm's memory.

ArsLexis' **Noah Pro** is considered by even dictionary snobs to be a cut above the rest. To suit most Palm OS-devices' tiny memory capacities, **Noah Pro** comes in various sizes—the largest packs an incredible 122,000 words into just 5MB of memory.

We're also partial to PalmFun's **Palmasutra**, a portable version of the *Kama Sutra* that provides grayscale, monochrome, or color illustrations, along with a notepad and check-off list. If that isn't a handy reference guide, we don't know what is.

Ars Lexis, \$20, [www.arslexis.com](http://www.arslexis.com); Palm Fun, free, [www.palmfun.surf.to](http://www.palmfun.surf.to)

If you live by the word, you die by the word. **OxfordCE 3.0** is for those times when a spell checker just won't do. This dictionary's shining features include the ability to tap any word within a definition, to also see the meaning of *that* word. The dictionary features more than 50,000 words; the thesaurus boasts some 10,000 words. One downside to loading both portions is the 17MB of space they'll take up on your Pocket PC, but you can always store the whole thing on a Compact Flash card.

IntelProg, \$16, <http://intelprog.com>

## Entertainment



Whoa! **PocketTV** lets you play MPEG files on your Pocket PC.

It's the one dot-com we hope never craters: **Vindigo.com**. Load the Vindigo application onto your PDA and PC, and the Vindigo web site will push customized information, such as restaurant reviews and the show times of local theaters, to your PDA each time you sync with your PC.

If you're just looking for restaurant reviews, check out Landware's world-famous **Zagat** guide for the Palm.

Vindigo, free, [www.vindigo.com](http://www.vindigo.com); Landware, \$30, [www.landware.com](http://www.landware.com)

Entertainment on the Pocket PC *really* means entertainment. Want to watch *To Kill a Mockingbird* or *Nosferatu* on your PDA? Download each film in its entirety from **Filmspeed.com**. (Of course, you'll need a 128MB Compact Flash card on which to store it.) The movies play on Microsoft's **Windows Media Player 7**, which is free from Microsoft.

FilmSpeed, free, [www.filmspeed.com](http://www.filmspeed.com)

## SOFTWARE CLEARINGHOUSES:

[www.tucows.com](http://www.tucows.com)

[www.palmadd.com](http://www.palmadd.com)

[www.freewarepalm.com](http://www.freewarepalm.com)

## SOFTWARE CLEARINGHOUSES:

[www.cearchives.com](http://www.cearchives.com)

[www.pocketgamer.org](http://www.pocketgamer.org)

[www.pocketpc.com](http://www.pocketpc.com)





**Novatel Minstrel 540** This 19.2Kbps modem gives the HP Jornada access to a nationwide CDPD network for \$39 a month. Omnisky, \$35, [www.omnisky.com](http://www.omnisky.com), 800.860.5767

(CONTINUED FROM PAGE 24)

## PALM

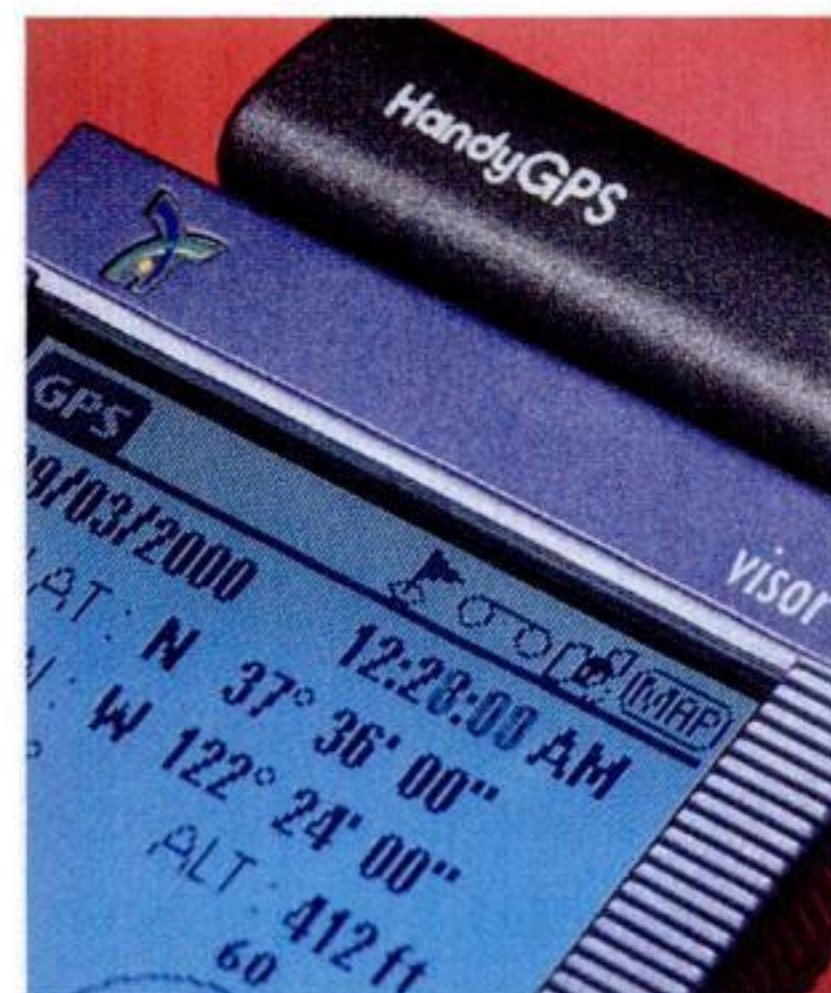
Palm's current lineup includes the ultra-budget M100—a 2MB entry-level model—and the only-slightly-more-luxe M105, which ups memory to 8MB. The company continues to offer the 8MB Illxe and color Illc models, but both are slated to be discontinued—as is the Palm Vllx, the company's first foray into the wireless Internet realm with e-mail capabilities and scaled-back web surfing. The Vllx's high cost and mediocre-at-best web experience (only sites offering content specifically tweaked for Palm viewing can be accessed) have kept it from really taking off.

The metal-clad Palm Vx has been the top-selling Palm model since 1998. With 8MB of RAM and an especially sleek formfactor, many consider the Palm Vx to be the ulti-

mate executive PDA, especially when equipped with one of the many snap-on wireless modems that perform better than the Vllx's. But before long, accessories for the new M500 and M505 will surely begin to appear en masse—and perhaps most notably, these models represent the first Palm units to which memory can be added. (For a closer look at the M505, see page 28.)

## HANDSPRING

Founded by Donna Dubinsky and Jeff Hawkins—the smart cookies credited with creating the original Palm—Handspring concentrates on selling cutting-edge, Palm OS-based hardware for less money than Palm sells its own merchandise. The Handspring lineup includes the 2MB Visor (a bare-bones PDA designed primarily for scheduling and contacts), and the Visor Deluxe, Platinum, color Visor Prism, and



**HandyGPS** Nexian's 12-channel receiver shows speed, altitude, latitude, and longitude on the screen of your Visor. Nexian, \$150, [www.nexian.com](http://www.nexian.com), 858.623.1544

new, superslim Visor Edge (see review on 83), all of which offer 8MB of memory. All Handspring models use the Palm OS and support Palm OS-based software, and all Visors *except* the Edge feature Springboard modules, slots via which a variety of peripherals can be added—the Edge favors a different connector than other Handspring models. Add-ons for this connector include a wireless phone, MP3 players, and digital cameras.

One weakness in the Handspring line is the devices' lack of flash memory, which makes upgrading a Handspring's OS nearly impossible.

## OTHER PALM OS DEVICES

Other than Handspring and Palm itself, two other companies offer PDAs that use the Palm OS. Sony's Clie line was once dismissed out of hand, but the newest Clie2 model features a color screen that offers twice the resolution of screens on Palm and Handspring units. Unfortunately, the Clie2's expansion capabilities are handled by the Sony MemoryStick, a technology that's going nowhere as far as *Maximum PC* is concerned.

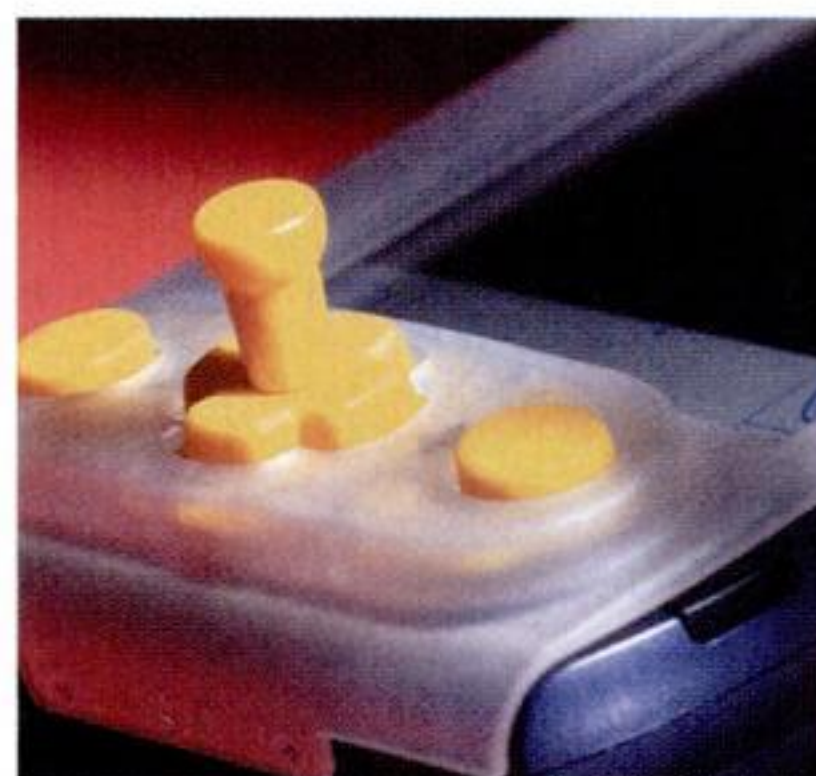
The other Palm OS contender, HandERA (formerly known as TRGPro), has long had a cult following among Palm users because of its ability to run applications from add-in memory cards. The TRGPro is dated now, but we expect to see a new round of products from the company soon.

## POCKET PC

Consumers may prefer Palm OS devices to Pocket PCs, but that hasn't stopped manufacturers from cranking out dozens of different devices for Microsoft's much-maligned OS. Unlike Palm devices, which share many



**EyeModule2** The EyeModule2 for Handsprings can snap VGA-resolution color images, or even teeny, tiny videos. Eyemodule, \$200, [www.eyemodule.com](http://www.eyemodule.com), 800.340.1001



**Handspring Gameface** Contacts, appointments... *Space Invaders*? Yep. Handspring's snap-on Gameface is custom-made for Palm OS-based games. Handspring, \$40, [www.handspring.com](http://www.handspring.com), 888.565.9393



similarities despite their different manufacturers, the individual producers of Pocket PC products have taken a variety of liberties with their designs. Expansion options run the gamut from Compact Flash to PC Card adapters. Button placement, controls, screens, memory amounts, and CPU speeds vary wildly from device to device.

Currently, the hottest Pocket PC unit is Compaq's iPaq 3600-series (see page 29). With 32MB or 64MB of RAM (depending on the model), a 206MHz CPU, and a color screen that works in bright sunlight, Compaq has devoted an entire factory to cranking out the high-demand devices. If you don't want to shell out for color, Compaq offers the budget 3100 series, with models that pack 16MB of RAM and a grayscale screen.

With the E-125, Casio has improved on its original Windows CE device, the E-100, which was the first to offer stereo MP3 output and a brilliant color screen. The E-125 packs 16-bit color, 32MB of RAM, and a 150MHz CPU. A budget version, called the E-115, has a lower price to match its lower CPU speed of 131MHz. Casio could be the first manufacturer of a Pocket PC device to break ranks in terms of expansion format, eschewing the Compact Flash slot found on most Pocket PC devices in favor of the Secure Digital card slot gracing the new Palm series.

Hewlett-Packard's Jornada series of Pocket PC devices includes the 548, with 32MB of RAM and a 133MHz Hitachi CPU, and the 520 series, which offers half the memory and a 256-color screen.

## CONVERGENCE PRODUCTS

Juggling a phone, PDA, and pager? Kyrocera's Smart Phone combines them into one device. By stuffing a Palm Pilot-caliber PDA

into a CDMA wireless phone, the Smart Phone hopes to lessen your load with a device that can place calls, hold your schedule, and retrieve e-mail via a wireless modem.

Convergence products are great for consolidating clutter, but they suffer from one serious disadvantage: They lock you into a particular cellular or PCS service. Should you move to an area where the service isn't available, you'll be stuck with a phone that's useless. And, like a television with a VCR in it, if one feature of the device dies, you have to ship the entire thing back for repair.

Other convergence devices include RIM's popular BlackBerry, which combines e-mail capabilities and basic contact and calendar information with a teeny keyboard. But unlike the wide variety of applications that can be added to Palm or Pocket PC devices, the few available for the BlackBerry are specifically targeted to corporate environments. The moral? If you're going to buy into a convergence device, be very sure it has everything you need.

## THINGS TO COME

What's on the PDA horizon? Like PCs, PDAs will continue to see added functionality and power. Expect more manufacturers to adopt lithium polymer battery technology, which allows designers to decrease the size of devices by filling the empty gaps in the case with a battery. And an upcoming technology called Bluetooth promises to erase the need for wires altogether by

including micro-size receivers and transceivers in PDAs and desktop computers, respectively. Early Bluetooth devices are making their debut now, but aren't likely to enter the PDA world for another 12 to 18 months. Another LAN wireless standard called Wi-Fi is already available on some Pocket PC devices, but the size of the transmitters and receivers and their hefty power consumption needs will likely keep Wi-Fi from becoming a true standard anytime soon.

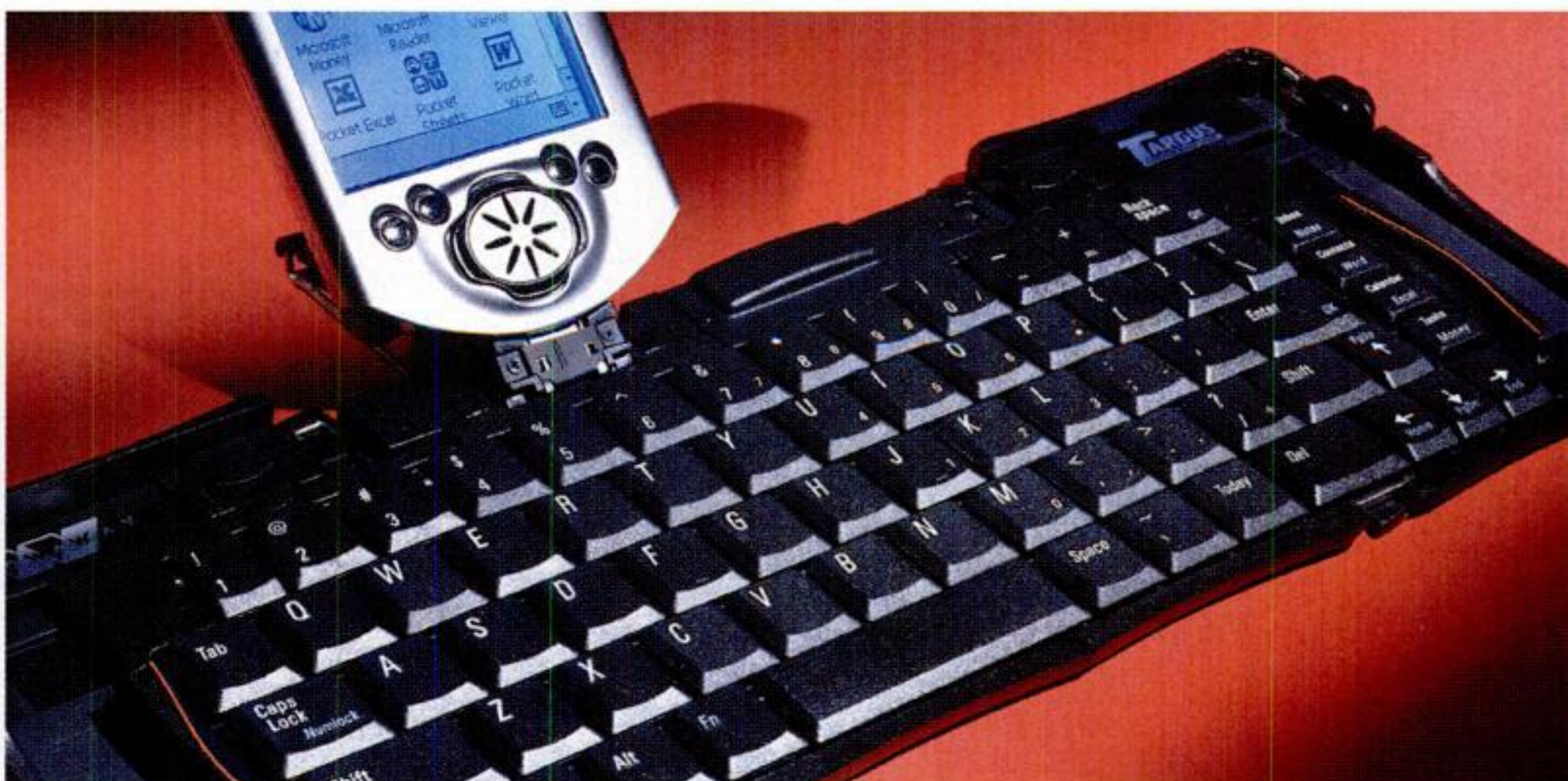
Will one company ultimately emerge as the ultimate manufacturer of PDAs? Many predicted Palm's demise when Microsoft first entered the PDA market—clearly a bad call. But even if Pocket PC devices continue to increase in popularity, there's enough room for both platforms. Expect to get plenty of service life from either a Pocket PC or a Palm. ■



**Sipix Pocket Printer A6** It prints from your Palm device (Pocket PC drivers are on their way) on mini sheets of thermal paper. Perfect for passing notes in class. Sipix, \$150, [www.sipix.com](http://www.sipix.com), 866.888.1678



**Viking 56K Compact Flash Modem** This 56K Compact Flash modem works with most Pocket PC units, and, with a PC Card adapter, it can be used in a notebook computer. Viking Components, \$150, [www.vikingcomponents.com](http://www.vikingcomponents.com), 800.338.2361



**Targus Stowaway Portable Keyboard** It folds up to the size of a deck of cards, but expands to practically a full-size keyboard. Even better, a Pocket PC device equipped with a Stowaway fits on even the most diminutive airplane tray-table. Targus, \$100, [www.targus.com](http://www.targus.com), 877.819.8572







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# OPERATION

ADDING  
RAM  
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DRIVE  
UPGRADES  
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BEFORE  
AND AFTER  
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# RETROFIT

***Follow along as we renovate three aging PCs and show you how to bring your own dusty dinosaur up to speed.***

By Logan  
Decker,  
Rob Pratt  
& Will  
Smith

PHOTOGRAPHY BY  
AARON LAUER

Thinking to upgrade your old PC? We can't do it for you, but we can get you moving in the right direction. Your training begins with a description of three retrofitting projects—glean what you can from these successful missions and apply the information to your own operation at home.

We invited three people to bring us their wretched computer refuse for thorough upgrading work. In return, they would receive the most respectable machines that \$500 in upgrades can buy. Your old clunker may differ from the PCs we work on in the following

pages, but you're sure to learn enough from our pursuits to undertake a mission of your own.

Of course, the point of adopting a fixer-upper is to get more for less. If you need a screaming PC that's packed with the latest and greatest hardware, well then, you'll need to spend a couple of grand on a new machine. A \$500 budget won't turn a quaint PC into a state-of-the-art Dream Machine, but it will bring it as up to date as possible. If you spend much more than five Franklins, you'll hit a point of diminishing returns. Of course, if your computer is saddled with

a Pentium-class motherboard, even \$500 worth of upgrades won't do enough to make much of a difference. You'd be better off spending maybe \$700 or \$800 for a new PC that hits (at the very least) Celeron or Duron territory.

To the right, you'll find descriptions of our three project PCs in their original states of disarray. On the following pages, we walk you through the steps that will get each of them up to speed. For a look at how our handiwork changed each machine's performance—and a list of the upgrades we made—see page 43.



# Gordo's NCC-2000

## A DIY fixer-upper

Its 700MHz CPU is still in good shape, but the NCC-2000 could use some help in the multi-media and gaming departments.



Senior Editor Gordon Mah Ung built this Classic Athlon-based system two years ago, and it's served him well in online matches of *Tribes* and *Star Trek: Elite Force*. But his model NCC-2000 (at least that's what the sticker says, right above the legend, "United Federation of Planets") quickly gets taken down in *Quake III*. Once a true champion, this system has lost most of its cutting edge. But a few savvy upgrades ensure it still has some bite left.

Since a 700MHz system has a healthy level of processing power for a fixer-upper, we'll focus on gleaning some extra gaming and CD-burning performance from this machine—and, of course, tidying up the case, inside and out, to conform to Federation standards.

# Dell Dimension V350

## System on the verge of a nervous breakdown

There was so much dust packed inside, we suspect this old, wheezing system blew out its own front bezel in an effort to get some air.



Introduced in March 1999, the Dimension V350 was initially praised for its smart combination of speed and economy. But like most value systems, the V350 struck a Faustian bargain: Cutting-edge technology came at the price of a limited upgrade path.

The owner of this V350 had recently installed a 12/4/32 Iomega Burn Proof ZipCD-RW drive, but reported that her PC, running Windows 98, had been "acting funny" and that, Burn Proof be damned, it was still burning coasters. This doesn't surprise us—her PC is so unstable, it can't run most of our benchmarks. We're going to have to work around this system's intrinsic upgrading limitations—onboard video and a motherboard that never anticipated the P-III—to see how fast we can rev it up while creating a stable, coaster-free environment.

After much cursing, we determined that the only way to eject a CD from the Pavilion 8260's CD-ROM drive was to reboot the machine.



# Hewlett-Packard Pavilion 8260

## Proud member of the old guard

The Pavilion 8260 was a powerhouse when initially released in 1996, but it's pretty archaic today. The Intel LX motherboard sports a Pentium II 266MHz processor and is equipped with a whopping 32MB of RAM (which might explain its owner's complaint that the machine has seemed "rather slow" lately).

Since the processor is sitting in an old LX motherboard, which is only capable of running early P-II's and Celerons, our CPU upgrading options are limited. But today's low memory prices mean a new DIMM or two are at our disposal and a much-needed upgrade in the 3D acceleration department is within our grasp (there's a vacant AGP slot, so our videocard options are wide open). The ancient hard drive and semi-functional CD-ROM drive (the drive tray will only open upon reboot) are certainly contenders for the rubbish pile.



## GORDO'S NCC-2000

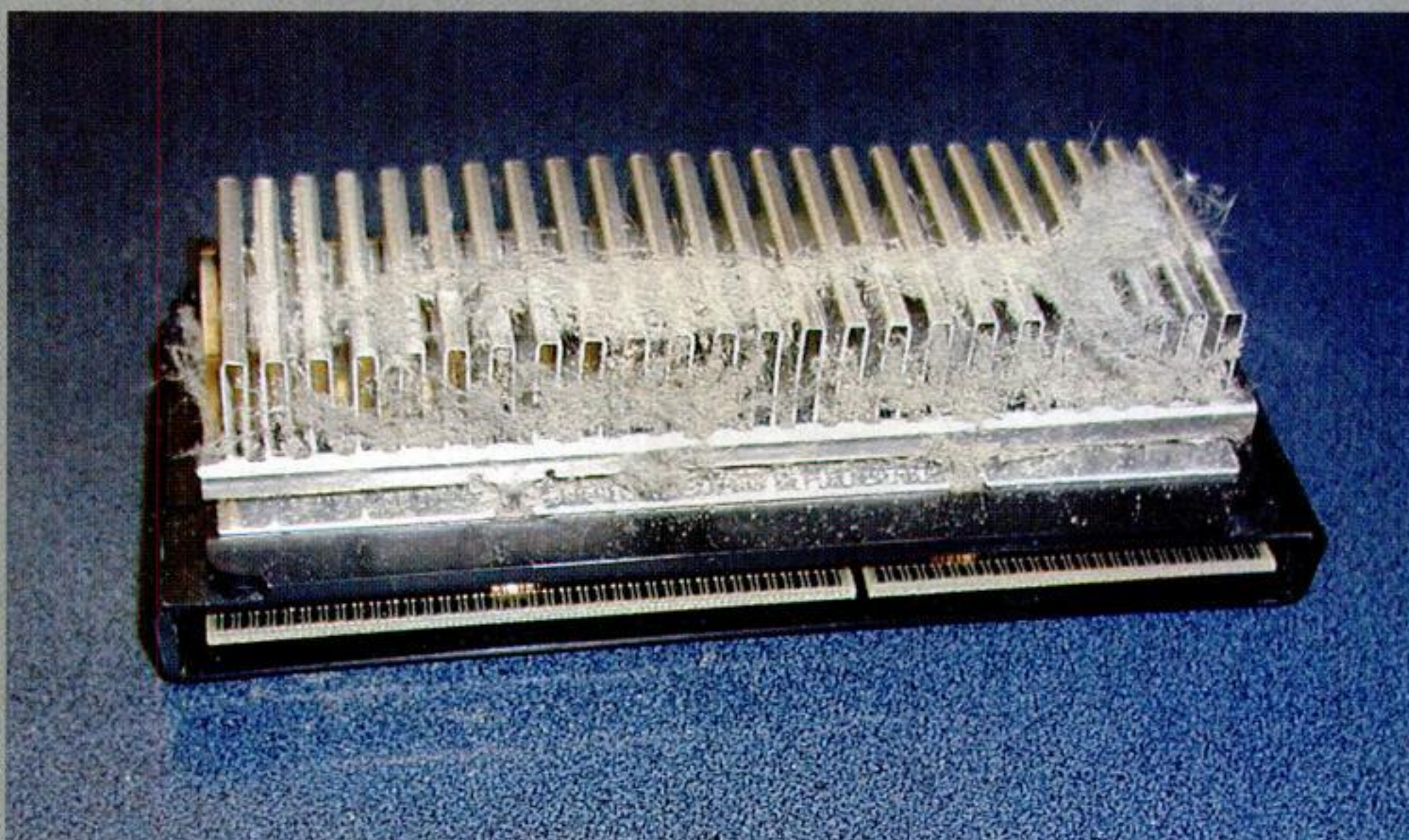


**1** The canned foam cleaner Blow Off (\$5) has anti-static properties that make it perfect for use in cases caked with grime from time spent under a desk. Don't spray it directly onto back-panel connectors; instead, spray it on a towel and clean around connectors.



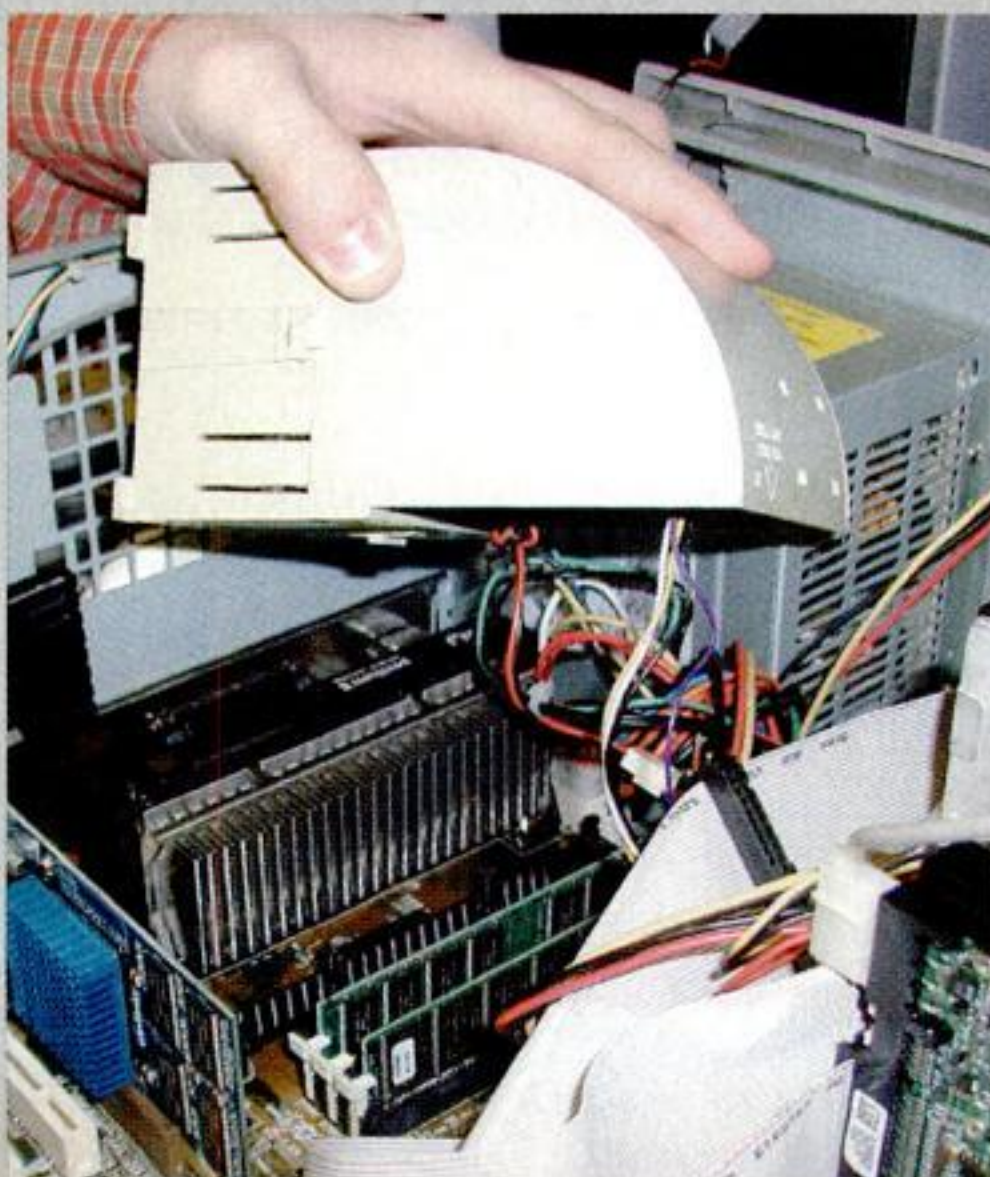
**2** Dust won't necessarily harm the power supply itself, but it will inhibit airflow through the case, causing a whole host of other problems. With a can of Falcon compressed air (found abandoned in the Lab), we blow the dust bunnies from the case and give the power supply a good once-over.

## DELL DIMENSION V350



**1** The original Pentium II 350MHz processor comes out looking like something a cat might cough up. While dust, in and of itself, isn't going to slow down a processor, it can accelerate corrosion on the contacts. Besides, it's just gross. Using a slightly damp, lint-free cloth and compressed air, we clean up the motherboard slot, and put the P-II 350 on display as a cautionary exhibit.

## HEWLETT-PACKARD PAVILION 8260



**1-2** We give the inside of the case a good dusting and settle down to our first task: replacing the CPU. Removing the shroud (far left) exposes the dusty old Pentium II 266. We yank out the old CPU and replace it with the Pentium II 333 (near left) that we bought for a song at a computer show (\$60). A 333MHz CPU is the fastest that the system's mother-board will support. If you make a purchase at a computer show, buy only boxed retail products—avoid loose parts in white boxes. And always use your credit card so you can dispute the charge if the part doesn't work properly.



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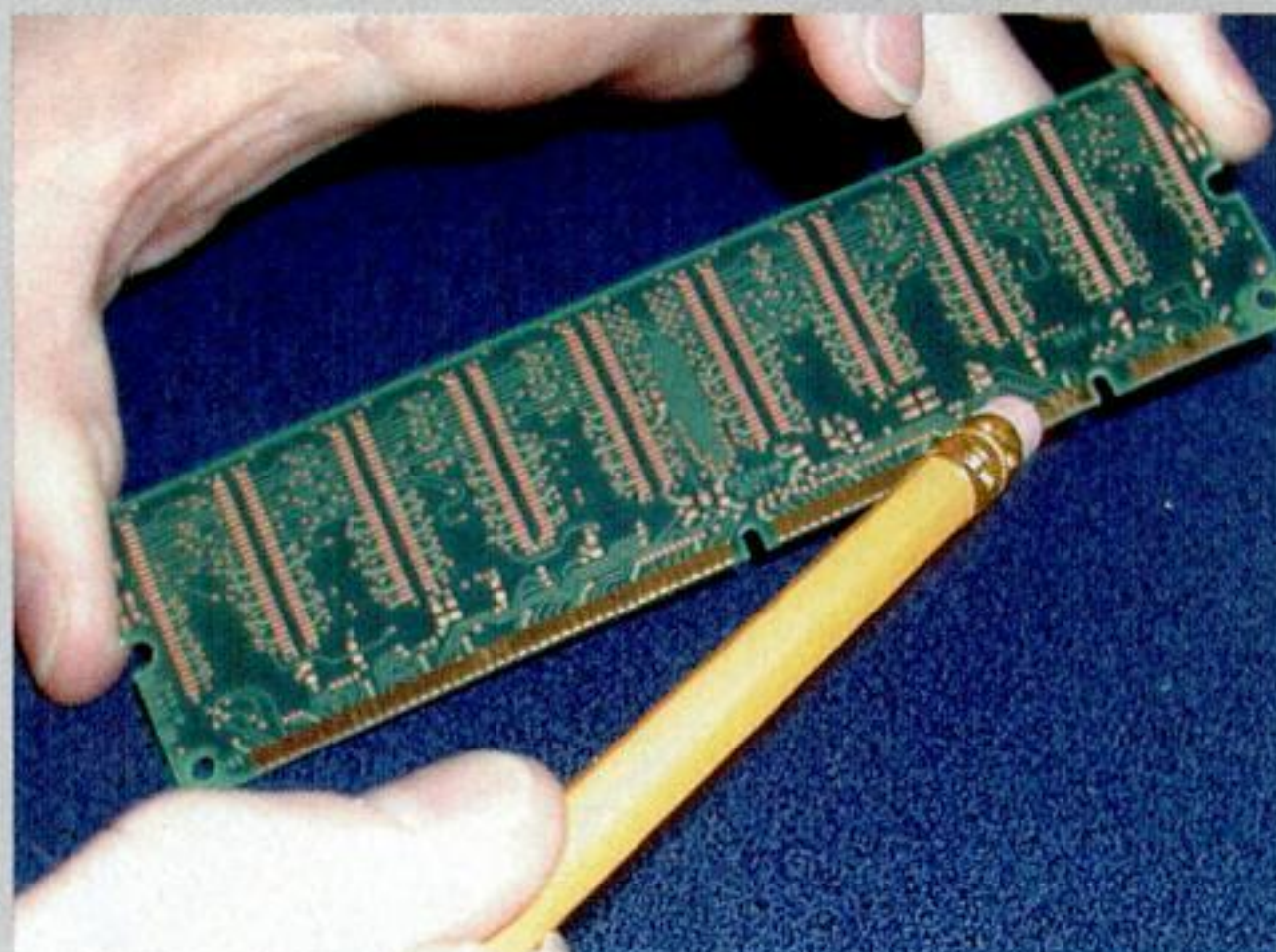
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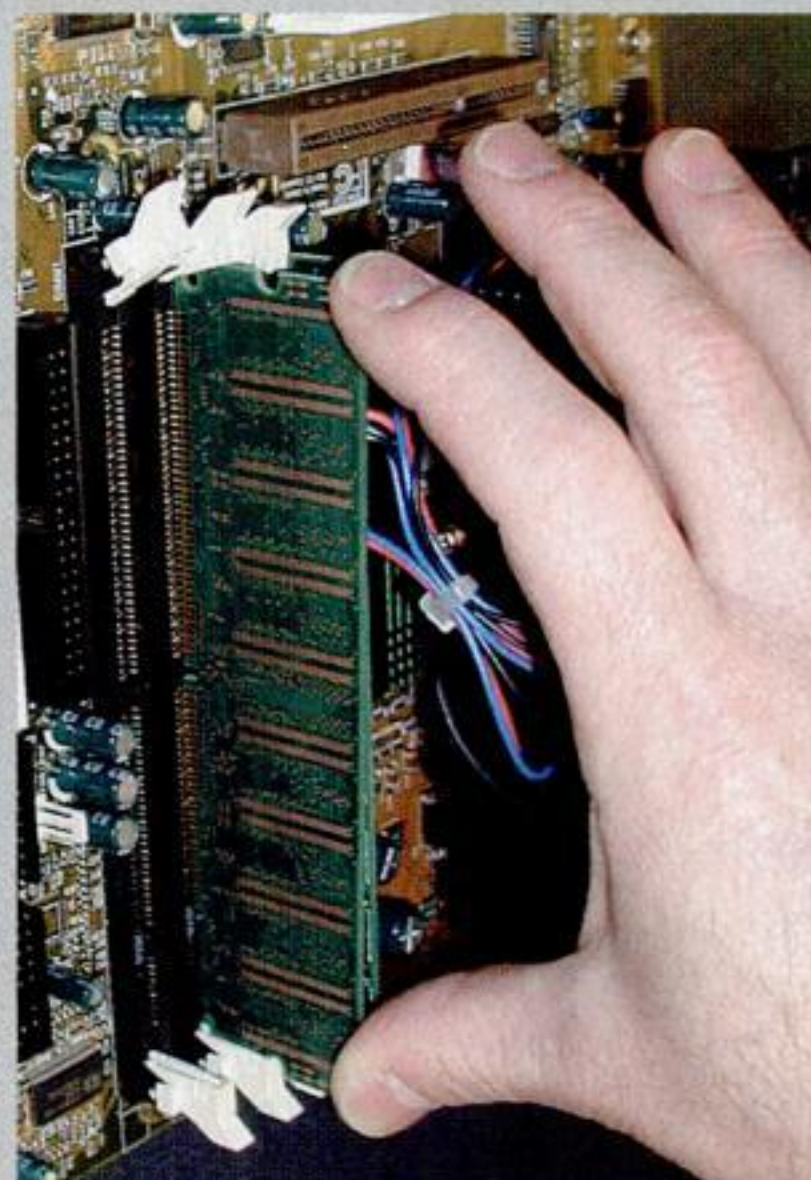
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## GORDON'S NCC-2000



**3** The motherboard in this Classic Athlon system, with a 200MHz double-pumped frontside bus, has plenty of speed, but looks rather grimy. A pencil eraser works well for cleaning muck and corrosion off DIMMs and PCI add-on cards. Just be gentle.

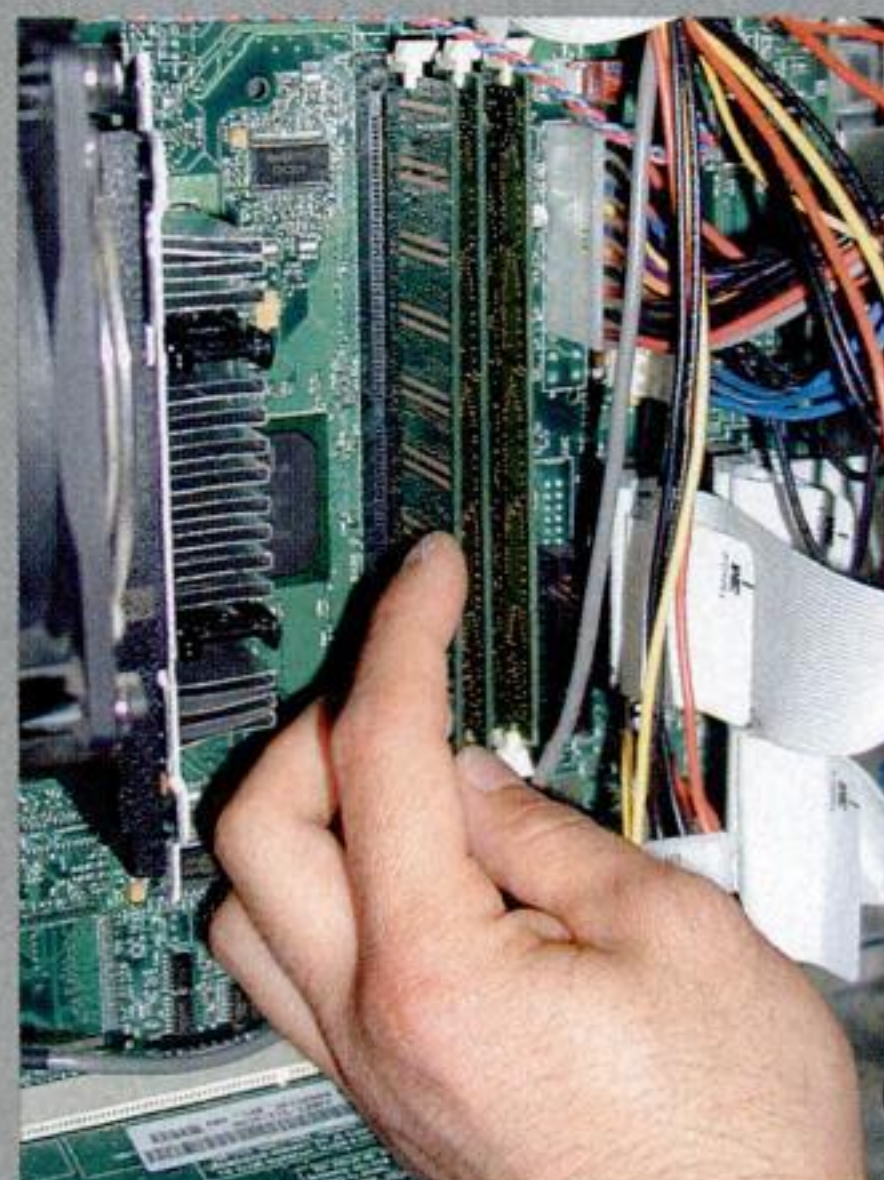


**4** When Gordon pieced together the NCC-2000 two years ago, 128MB did the job for most applications. But with prices on single-data-rate SDRAM at an all-time low, upgrading memory is by far the cheapest way to squeeze more performance out of an older PC. We added another 128MB PC133 DIMM (\$50) from Crucial Technology.

## DELL DIMENSION V350

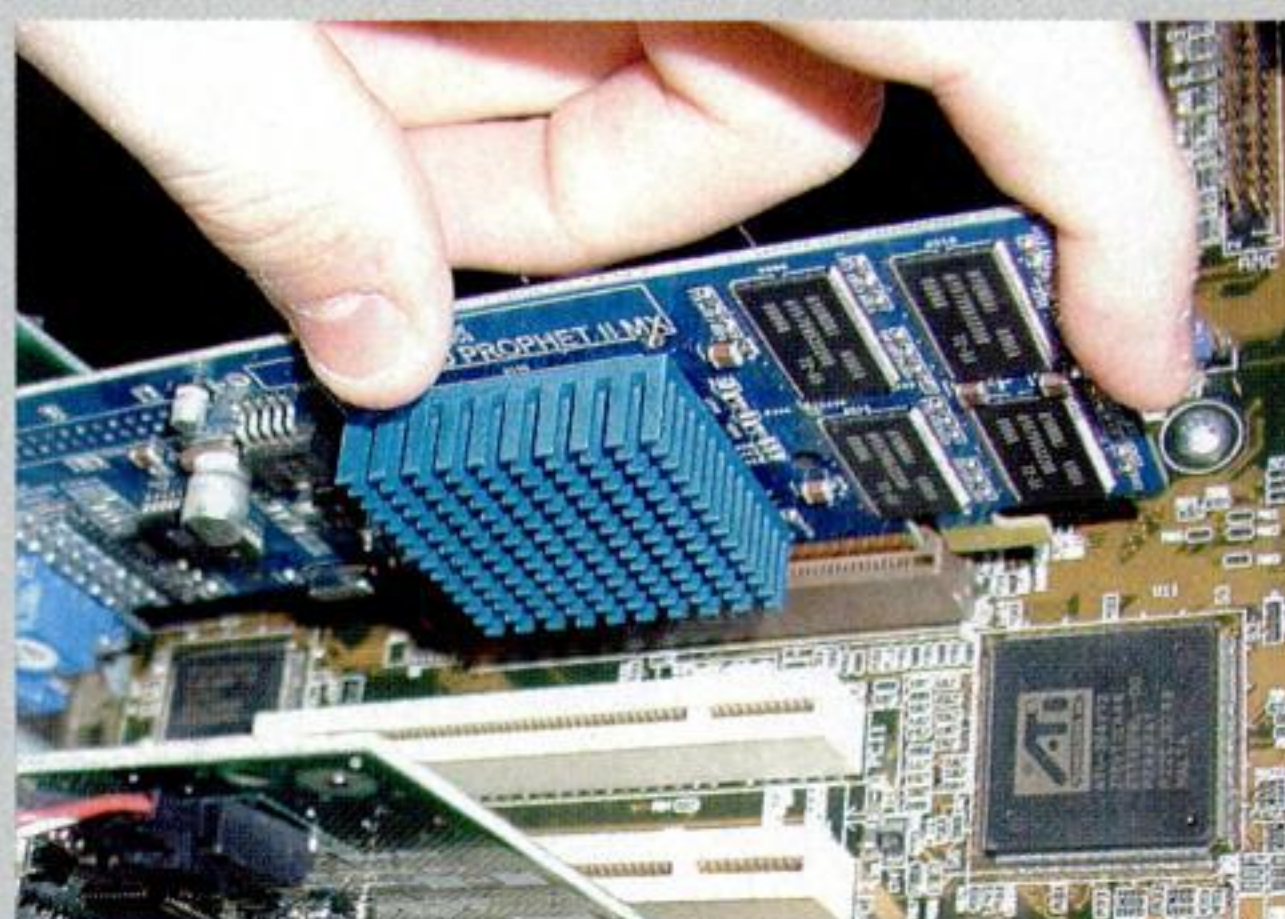


**2** The motherboard will only clock up to 450MHz, but we're optimists, so we pop in a Pentium III 500MHz (\$165) anyway. Lo and behold, the processor is welcomed into its new habitat! Dare we try a P-III 600MHz? No—the heat generated by that CPU might overtax our geriatric system's cooling solution.

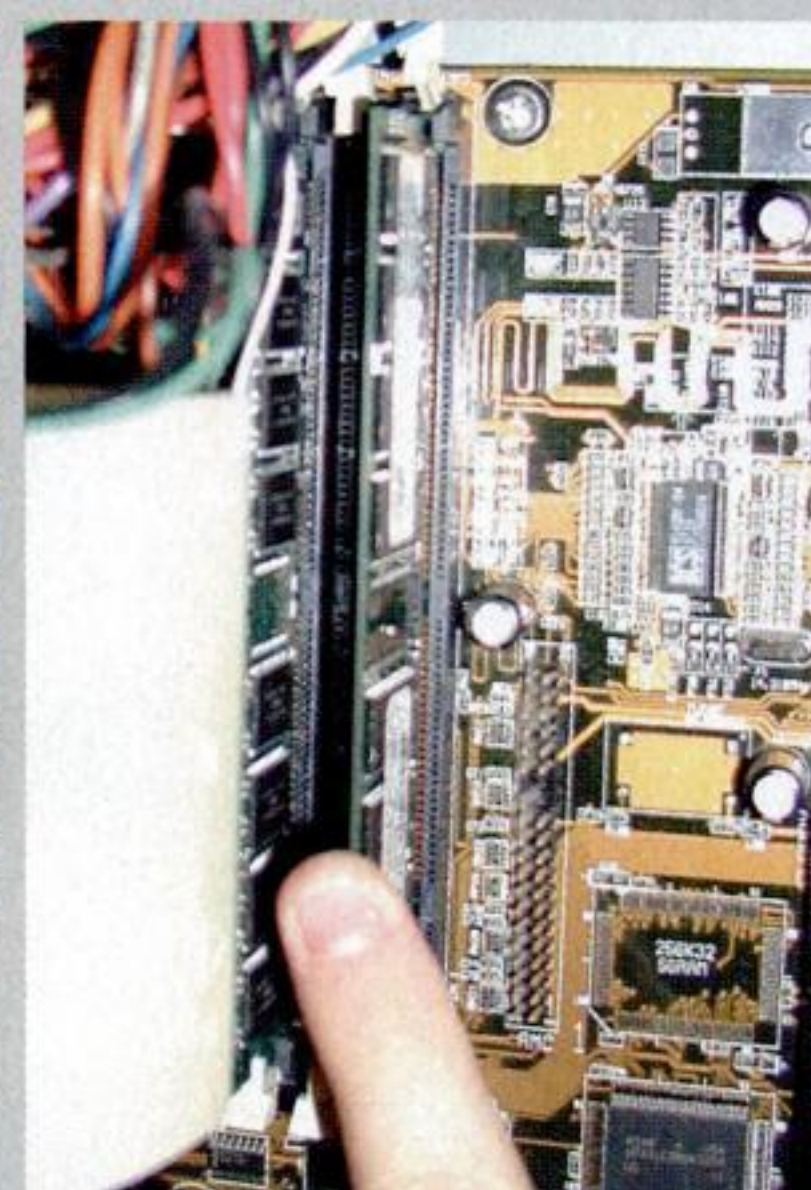


**3** We supplement the paltry dual 32MB DIMMs with a 128MB PC100 DIMM (\$30), for a total of 192MB of RAM. The extra head-room means Windows won't have to lean so heavily on the swap file. Why not add more? After 192MB, you're looking at diminishing returns in terms of the price-to-performance ratio.

## HEWLETT-PACKARD PAVILION 8260



**3** Improving 3D performance requires disabling the PCI ATI Rage LT 3D soldered onto the motherboard. Luckily, this machine has an AGP port, into which a Hercules Prophet II MX AGP (\$90) fits nicely. If you have trouble disabling onboard video, look in the BIOS for an option to disable it, or disable it via the Device Manager.



**4** The 32MB of generic PC66 SDRAM that Hewlett-Packard provided makes it virtually impossible to run more than one application at a time. Adding a 128MB stick of PC100 SDRAM (\$30) takes care of that problem. Why PC100? PC66 is no longer available, and PC133—though it would have been a hedge against obsolescence—isn't an option on a system this old.





**5** The Voodoo3 3000 that came in this PC put forth the kind of low frame rates that mean death in multiplayer gaming. A top-of-the-line GeForce2 Ultra videocard is a bit of a wallet-buster, so we opt for the next best thing in a slightly slower AsusTek V7700 GeForce2 Pro (\$250).



**6** With 4x record/4x rewrite/24x read speeds and no Burn Proof technology to avoid the buffer underruns that cause coasters, the HP CD-Writer Plus 8100 originally installed in this system has to go. We replace it with TDK's VeloCD (\$190), one of the fastest Burn Proof CD-RW drives we've seen.

## GORDON'S MCC-2000



**4** The old 8GB Maxtor hard drive is a real house of horrors, with 40MB file fragments strewn about the root directory, cross-linked files, and even a sobering partition error. No wonder the machine was "acting funny." We'll skip the lecture about judicious use of Scandisk and Defrag—the one in which we admonish you to use the utilities at least monthly, and to Scandisk after every crash. We image the sickly hard drive to preserve the owner's data, and replace the Maxtor with an ultra-reliable 30GB IBM Deskstar (\$144), which allows plenty of room for all those MP3s she'll be collecting.

## DELL DIMENSION V350

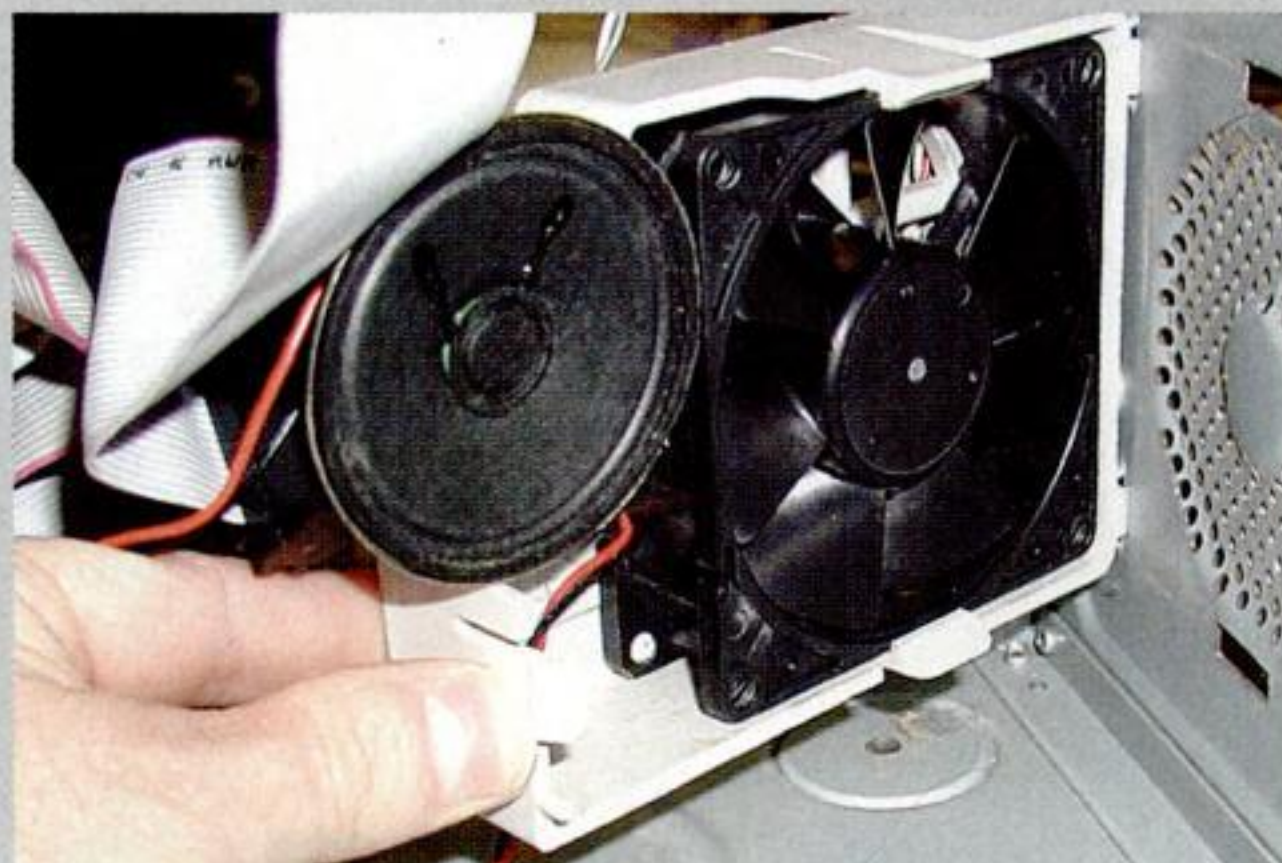


**5** The generic CD-ROM drive that shipped with the system isn't functional now, but even when it was, its read speed couldn't have been much to write home about. A new Ricoh CD-RW 12/10/32 CD-burner drive (\$130) opens an entirely new world of multimedia options.

## HEWLETT-PACKARD PAVILION 8260



## GORDO'S NCC-2000

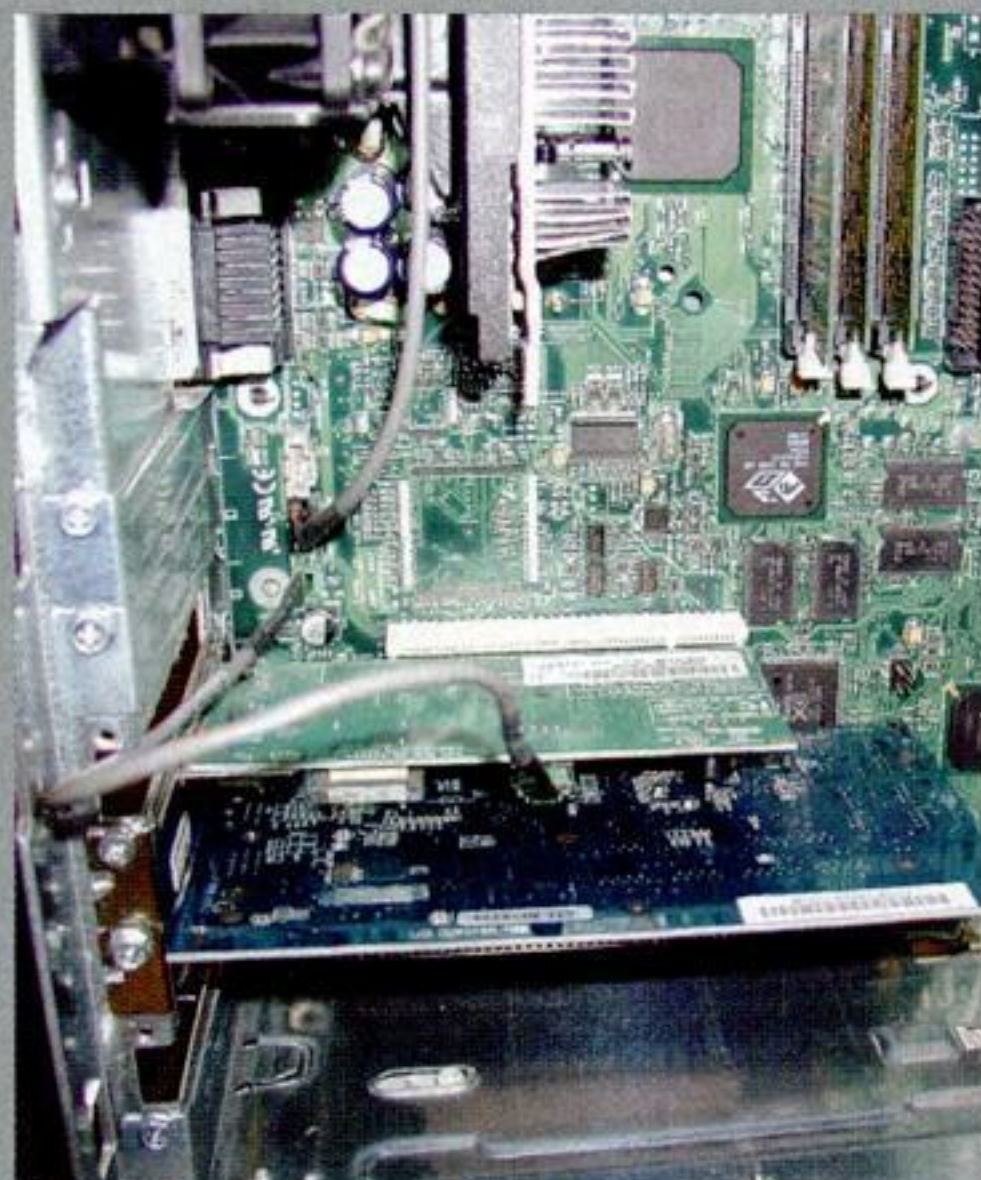


**7** Case cooling is a critical factor for Athlon CPUs, which, in general, run hotter than other processors. The NCC-2000 ran warm to the touch from the start—our upgrades will add a few more degrees. So, we'll stick another generic 80mm fan (\$5) to the front bezel of the case, offsetting the additional heat generated by a pumped-up videocard and a faster optical drive.



**8** After just a year of use, the Windows Registry can get so knotted that it will bring even a high performance system to its knees. We reformat the hard drive, reinstall Windows 98 SE, and ensure the latest hardware drivers are installed. The result? Boot time is cut by about a minute.

## DELL DIMENSION V350



**5** We install a fresh copy of Win 98SE (upgrade, \$50) and turn to the videocard. No AGP slot means the best videocards aren't an option, so we opt for a Hercules 3D Prophet II MX PCI with the GeForce2 MX chip (\$100). The best PCI cards still offer better fill rates than those of the motherboard-bound ATI Rage Pro, which runs on the AGP bus but barely takes advantage of its bandwidth.



**6** The finishing touches. We replace a missing bezel (25¢) on the front of the case, so it no longer looks like a toothless hag. A vigorous scrubbing with water removes scuffs from the faceplate, and, with some pride, we scrape off the stigmatizing "Pentium II Inside" sticker (vegetable oil gets rid of the gummy residue).

## HEWLETT-PACKARD PAVILION 8260



**6** The puny 8GB Quantum Bigfoot drive probably spins at about the speed of a toy top, and it takes up an entire 5.25-inch drive bay. What a waste of space! We finally figure out the Rube Goldberg contraption that HP used to seal the Pavilion's case, and replace the Bigfoot with a much bigger, much faster 20GB IBM 75GXP (\$107) in the 3.5-inch drive bay. A clean install of Windows 98 SE (upgrade, \$50) completes our refurbishing.



## BEFORE

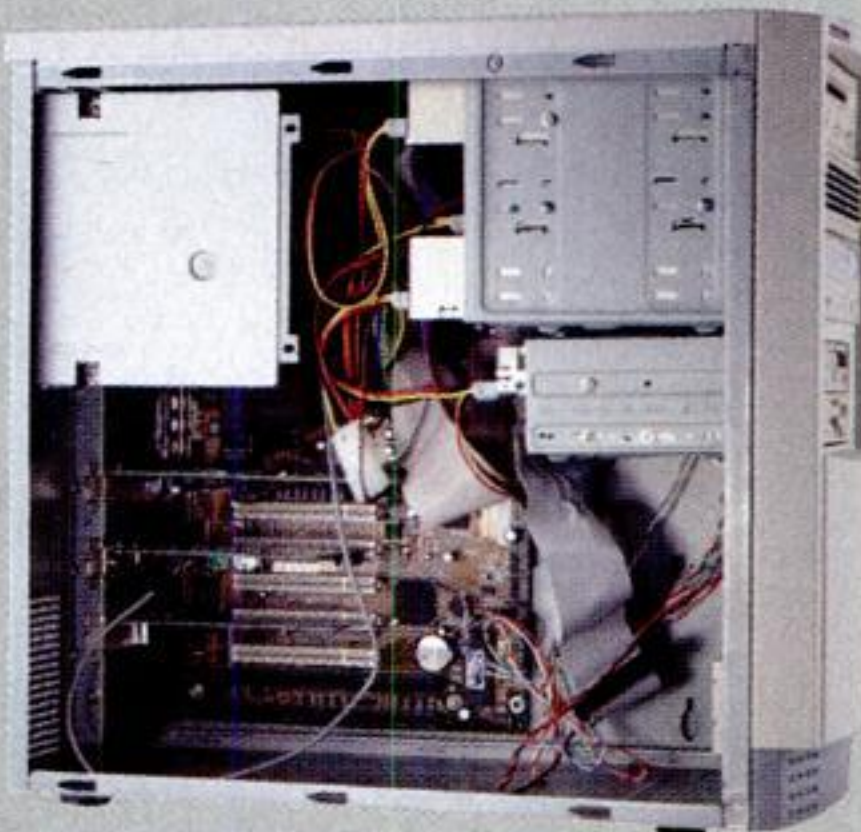
128MB PC133 DIMM  
3Dfx Voodoo3  
CD-Writer Plus 8100i

### PERFORMANCE

|              |                      |
|--------------|----------------------|
| SYSmak2001   | <b>72</b>            |
| Premiere 6.0 | <b>422sec</b>        |
| Audiograbber | <b>542sec</b>        |
| MusicMatch   | <b>592sec</b>        |
| Quake III    | <b>17.1fps</b>       |
| 3DMark 2001  | <b>Would not run</b> |

## GORDO'S NCC-2000

Even do-it-yourselfers must face the day when their hand-built vessels no longer boldly go where no PCs have gone before. That doesn't mean that this box is due for decommissioning, however. With some attention to the critical subsystems and a recharge of the dilithium crystals—er, rather, some case cleaning—even a classic can be readied for the next generation.



## AFTER

Blow Off foam cleaner \$5  
Crucial 128MB PC133 DIMM \$50  
AsusTek V7700 GeForce2 Pro \$250  
TDK VeloCD CR-RW drive \$190  
Generic 80mm fan \$5  
**TOTAL COST: \$500**

### PERFORMANCE

|              |                      | % DIFFERENCE   |
|--------------|----------------------|----------------|
| SYSmak2001   | <b>71</b>            | <b>-1.4%</b>   |
| Premiere 6.0 | <b>414sec</b>        | <b>+1.9%</b>   |
| Audiograbber | <b>250sec</b>        | <b>+53.9%</b>  |
| MusicMatch   | <b>567sec</b>        | <b>+4.2%</b>   |
| Quake III    | <b>34.9sec</b>       | <b>+104.1%</b> |
| 3DMark 2001  | <b>Would not run</b> |                |

## BEFORE

Pentium III 350MHz  
64MB PC100 RAM (two 32MB DIMMS)  
8GB Maxtor hard drive  
Windows 98  
Onboard ATI Rage Pro AGP

### PERFORMANCE

|              |                      |
|--------------|----------------------|
| SYSmak2001   | <b>Would not run</b> |
| Premiere 6.0 | <b>838sec</b>        |
| Audiograbber | <b>338sec</b>        |
| MusicMatch   | <b>1377sec</b>       |
| Quake III    | <b>Would not run</b> |
| 3DMark 2001  | <b>Would not run</b> |

## DELL DIMENSION V350

This wheezing, compromised PC really should have been wheeled in on a gurney. Still, a value system needn't be burdened by built-in obsolescence. A few simple and inexpensive workarounds boosted MP3 encoding by 161 percent, shaved over five minutes off our rigorous *Premiere 6.0* benchmark, and delivered a respectable score in our *SysMark 2001* tests. It even burned CDs while minding other tasks.



## AFTER

Pentium III 500MHz \$165  
128MB PC100 DIMM \$30  
30GB IBM Deskstar hard drive \$144  
Windows 98SE upgrade \$50  
Hercules 3D Prophet II/GeForce2 MX \$100  
Replacement bezel \$0.25  
**TOTAL COST: \$489.25**

### PERFORMANCE

|              |                      | % DIFFERENCE  |
|--------------|----------------------|---------------|
| SYSmak2001   | <b>54</b>            | <b>N/A</b>    |
| Premiere 6.0 | <b>532sec</b>        | <b>+36.5%</b> |
| Audiograbber | <b>335sec</b>        | <b>+0.9%</b>  |
| MusicMatch   | <b>859sec</b>        | <b>+37.6%</b> |
| Quake III    | <b>2fps</b>          | <b>N/A</b>    |
| 3DMark 2001  | <b>Would not run</b> |               |

## BEFORE

Pentium II 266MHz  
32MB PC166 DIMM  
8GB Quantum Bigfoot hard drive  
Windows 95 OSR2  
Onboard ATI Rage LT PCI  
Goldstar CD-ROM drive

### PERFORMANCE

|              |                      |
|--------------|----------------------|
| SYSmak2001   | <b>Would not run</b> |
| Premiere 6.0 | <b>Would not run</b> |
| Audiograbber | <b>Would not run</b> |
| MusicMatch   | <b>1,885sec</b>      |
| Quake III    | <b>Would not run</b> |
| 3DMark 2001  | <b>Would not run</b> |

## HEWLETT-PACKARD PAVILION 8260

We were pleasantly surprised with the results of our handiwork on this rig. While the original machine would run only one benchmark, the upgraded machine made its way through three of our tests. We weren't able to trim much time in the MP3 encoding department, but the machine did successfully burn some CDs while running other applications simultaneously.



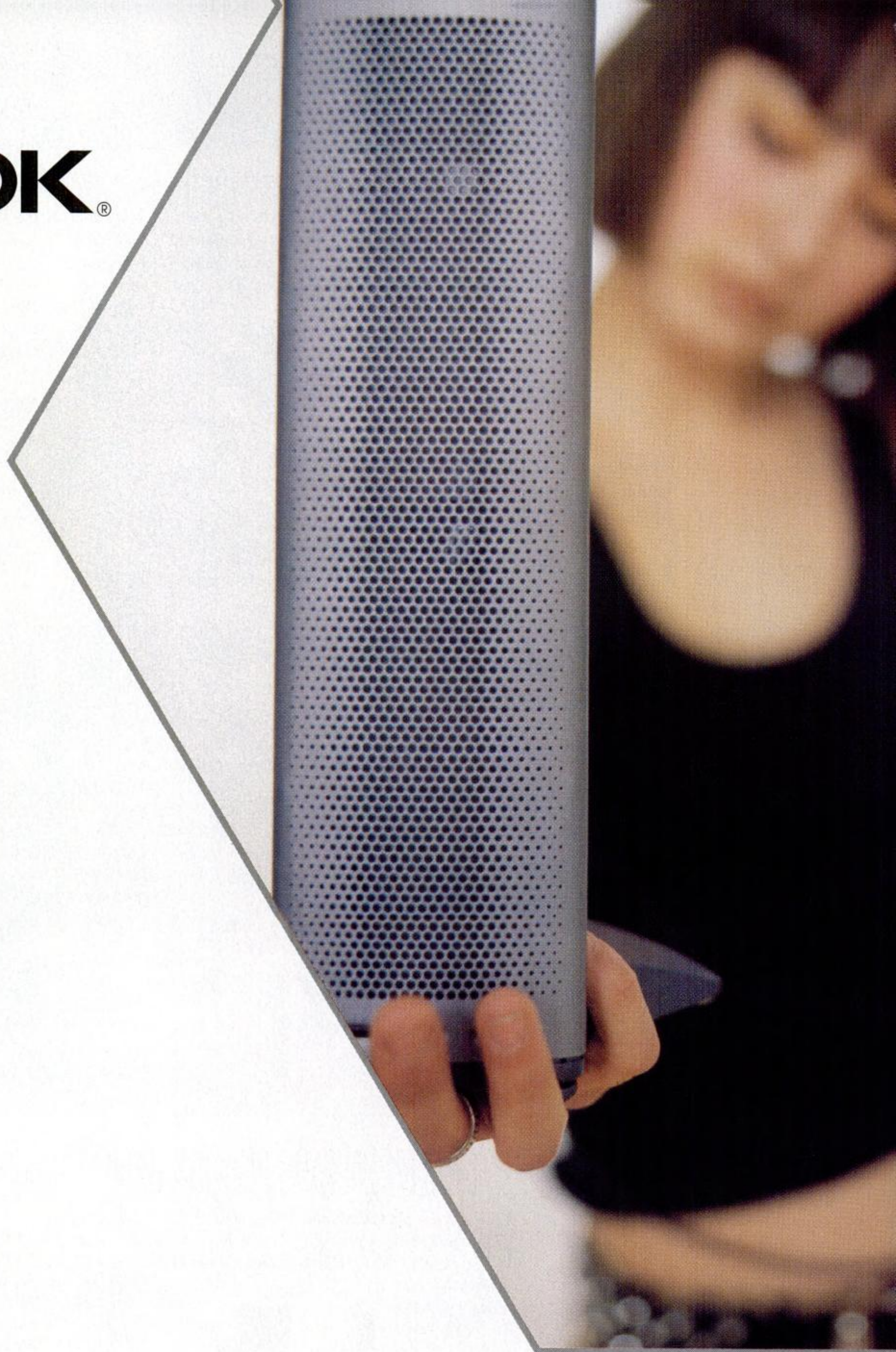
## AFTER

Pentium III 333MHz \$60  
128MB PC100 DIMM \$30  
20GB IBM Deskstar hard drive \$107  
Windows 98SE upgrade \$50  
Hercules 3D Prophet II MX \$90  
Ricoh 7120 12/10/32 CD-RW \$130  
**TOTAL COST: \$467**

### PERFORMANCE

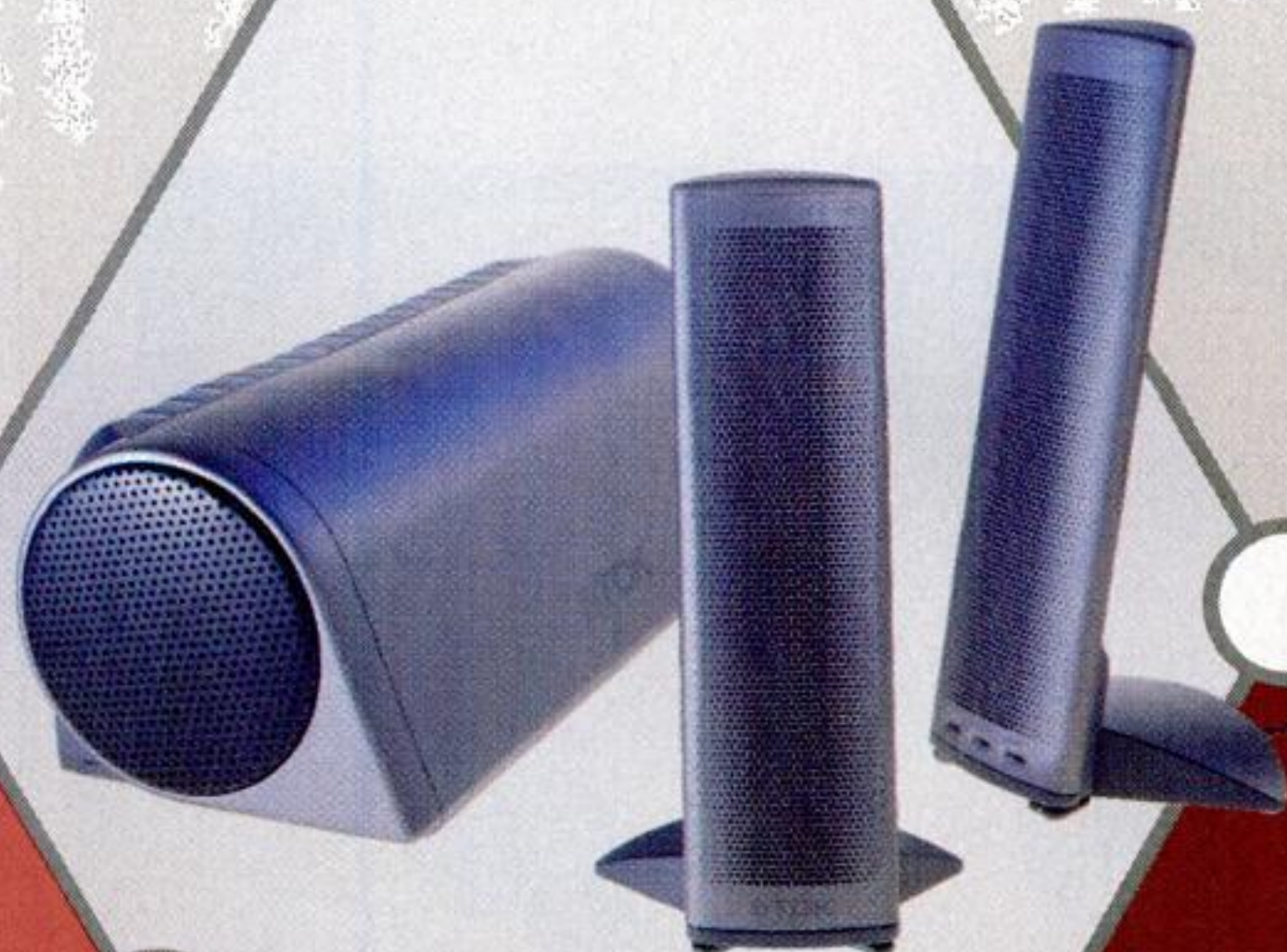
|              |                      | % DIFFERENCE |
|--------------|----------------------|--------------|
| SYSmak2001   | <b>Would not run</b> |              |
| Premiere 6.0 | <b>Would not run</b> |              |
| Audiograbber | <b>501sec</b>        | <b>N/A</b>   |
| MusicMatch   | <b>1,881sec</b>      | <b>+0.2%</b> |
| Quake III    | <b>7.7fps</b>        | <b>N/A</b>   |
| 3DMark 2001  | <b>Would not run</b> |              |







# XXL Sound



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By Will Smith

PHOTOGRAPHY  
BY AARON LAUER

# IT MATTERS

***Bigger is better—especially when it comes to playing games and watching DVDs from your PC. A slew of new big-screen, high-res displays just might make your desktop monitor obsolete.***

**T**here's simply no denying it: It's more comfortable to watch a DVD from the couch in your living room than from the chair in front of your computer desk. In fact, coaxing any of your computer's contents off the desktop and onto the television would, by most accounts, be a welcome change—too bad your television isn't remotely capable of displaying the resolutions that your monitor can. It's a conundrum that's frustrated entertainment aficionados for ages: Televisions boast larger viewing areas, but resolution tops out at 640x480; desktop displays support higher resolutions, but sacrifice screen space. And despite all accounts to the contrary, size matters.

Marrying massive screens and support for high resolution, high-definition (HD) digital displays deliver DVD-viewing and game-playing that can best be described as lush. The HDTV specs boast much higher resolutions

than the measly 480 interlaced lines current television sets are capable of displaying. And some HD displays can support progressive resolutions—which means that each line on the screen is displayed 60 times each second, as opposed to the interlaced display your regular television can muster, which alternates between lines drawn only 30 times each second. HD displays can support resolutions of 1280x720 progressive and 1920x1080 interlaced, in addition to standard television resolutions.

The upshot? Big-screen, high-definition monitors are capable of displaying resolutions that are comparable to those your computer displays. When partnered with a TV tuner-equipped videocard, they can take the place of your boob tube. And if playing *Black & White* on a friend's 21-inch desktop CRT can cause decent, honest people to commit two of the seven deadly sins (lust and envy—which ones did you think we meant?), imagine

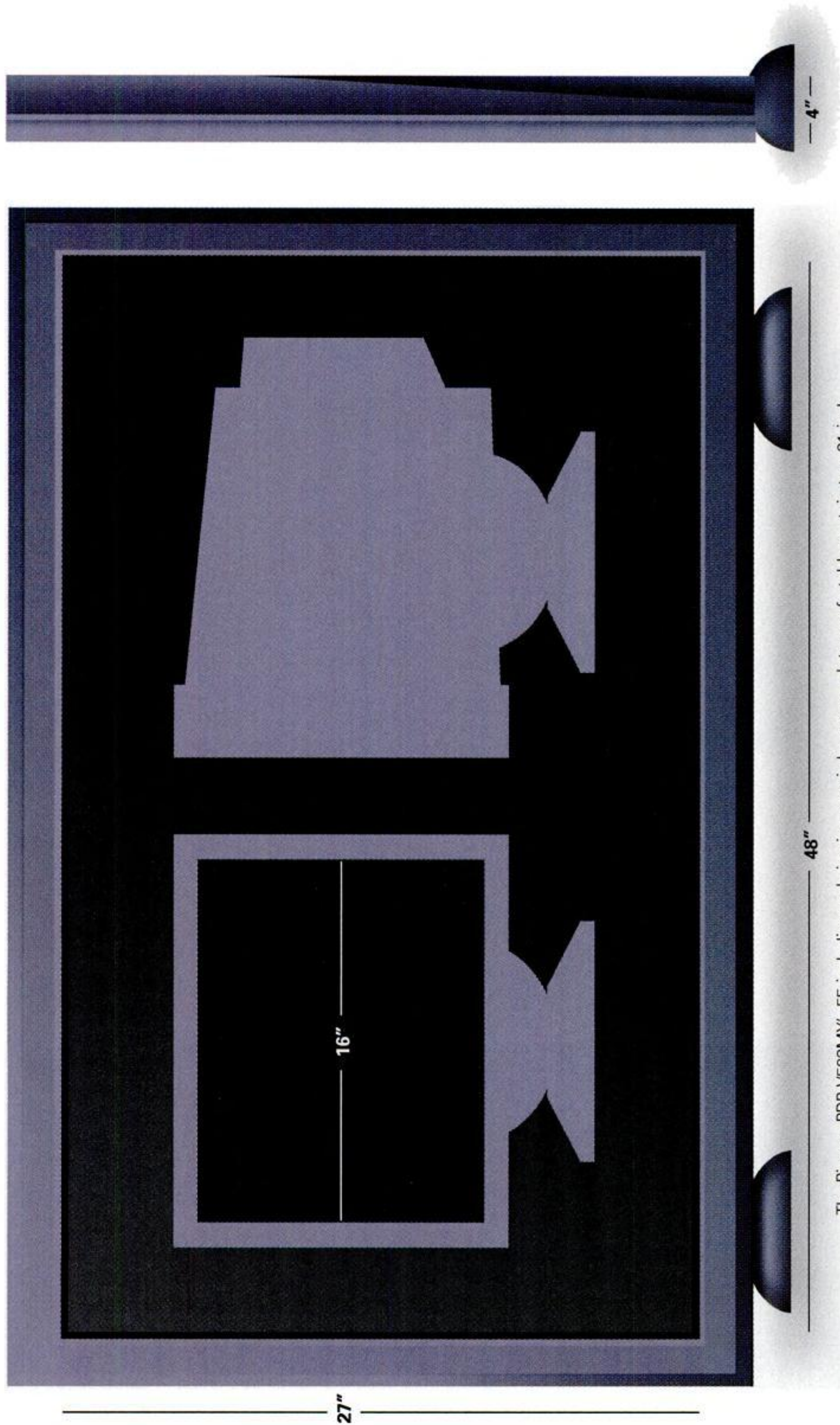
what playing on a 36-inch CRT will do. Or a 40-inch plasma display. Or a 120-inch projected display. They're big, they're beautiful, and they're designed to hold court as the center of your home entertainment center.

Did we mention what multiplayer *Quake III Arena* is like on a 120-inch projected display?

If you go to buy a large-screen display, you'll be assaulted with devices that use every imaginable technology to create an image on your screen. Right now, you can buy displays that are based on oversized CRTs, plasma, LCD projectors, rear-projection CRTs, and rear-projection DLPs. Which one is right for you? It depends on how you plan to use your new toy, and, of course, how much you're willing to spend on it. On the following pages, you'll find descriptions of each technology and reviews of three big screens you might encounter when you go to make a purchase.



# What makes a big screen? For starters, a display that dwarfs your desktop monitor.



The Pioneer PDP-V502MX's 55-inch diagonal viewing area is large enough to comfortably contain two 21-inch monitors. Or it would if the entire display weren't just four inches thick.



## DIRECT VIEW CRT

CRTs aren't sexy, but they're available and cheap. Are they right for you?

**PAGE 48**



## LCD PROJECTOR

The biggest of the big are front-projection systems. We show you how they tick.

**PAGE 49**



## PLASMA

They create great images, but are exorbitantly priced. Are they worth it?

**PAGE 50**



## REAR-PROJECTION CRT

We tell you how they work and why they're going the way of the dodo.

**PAGE 52**



## REAR-PROJECTION DLP

The new wonder technology that will eventually replace rear-projection CRTs.

**PAGE 52**



# DIRECT-VIEW CRT

Using the same basic cathode ray tube (CRT) technology found in traditional shadow-mask desktop monitors, this new breed of display offers high, 1024x768 resolutions across screen real estate that challenges some of the biggest television sets. At press time, only Princeton was shipping these big displays.

**HOW IT WORKS** An electron gun shoots a beam of electrons from the back of a vacuum tube onto the front of the tube. The other side of this tube is the piece of glass you look at when you watch TV or sit at your computer—a piece of glass coated with phosphors on the electron-gun side. When the electrons are shot to the front of the tube, they transfer their energy to the phosphors, causing them to glow. Electromagnets move the electron beam rapidly up and down the glass and the glowing phosphors create an image. (For a more detailed explanation of this process, see our White Paper in the August 1999 issue of *Maximum PC*.)

**THE UPSIDE** CRTs produce clear, bright images in even the brightest rooms, and they're relatively inexpensive compared to the other technologies described in this article. And in case you were wondering, the phosphors used in modern CRTs are resistant to burn-in (despite the continued, prodigious use of screen savers). Burn-in is caused when the phosphors on the inside of the viewing surface become so overexcited, they can no longer be "energized," resulting in a ghost image that remains permanently on your screen.

**THE DOWNSIDE** If you want a direct-view CRT for your large-screen computing needs, you'd better have a spacious living room. In order for the electron gun to hit the entire viewing surface of a CRT, it must be located a certain distance from the viewing surface. Therefore, a 36-inch tube must be at least 25 inches deep—resulting in a very large overall package. Additionally, as the tube gets larger, the glass on the viewing side must be thicker—resulting in a very heavy overall package. The 36-inch Princeton display reviewed on this page weighs 200 pounds. Finally, don't expect the fine dot pitches found in desktop displays; as the screen gets bigger, the dot pitch gets coarser.

**THE BIG PICTURE** If you have the space, a large direct-view CRT makes an excellent monitor/television for a more-or-less reasonable cost.

## Size Matters

The AV3.6's speakers aren't Klipschian, but they're certainly better than those found on a normal computer monitor. True home-theater enthusiasts will just disable the onboard speakers in favor of an external Dolby 5.1 rig.

The integrated Ch1 Internet appliance would be great if the AV3.6 was just a TV, but we can't imagine why Princeton would add such a worthless accessory to a monitor/TV, further jacking the costs.

The tube required for a CRT this large adds up. The AV3.6 weighs as much as a full-grown Saint Bernard.



## PRINCETON AV3.6

*A big screen with a little price*

The Princeton AV3.6 is a big, heavy, impractical direct-view CRT display. It suffers from geometric distortion. It has a dot pitch that would make your ophthalmologist cringe. But, for the price, it also delivers the best overall large-screen experience we've had so far. Go figure.

The AV3.6 is a 36-inch viewable monitor/TV combination, equipped with a TV tuner and several composite, S-video, component, and monitor inputs. It also includes a redundant, integrated Internet appliance made by Ch1. Why would anyone pay \$3,000 for a computer monitor the size of a large TV and use an Internet appliance on it instead of a computer? We don't know either.

Still, the main criteria by which we judge any display is image quality. While the AV3.6 has flaws—including loss of color purity in the corners of the screen, an annoying tendency to display fine white vertical lines as purple,

and geometric distortion that renders perfect squares as rectangles—they're the sort of problems a similarly sized television would suffer. The main problem is that, at a resolution of 1024x768, the screen's incredibly fat dot pitch (0.90mm) makes fine text illegible. But then, were you planning to do word processing on a 36-inch screen?

The AV3.6 shines where we think it really counts: gaming and DVD viewing. If you're embroiled in a serious game of *Counter-Strike*, the slight distortion in the screen's bottom corners and its high dot pitch won't even register on your radar. The AV3.6 isn't suitable as a full-time monitor, but it's a great display for a home entertainment center. And for what its worth, we saw many fewer display flaws in the AV3.6's 32-inch cousin when we featured it in the August 2000 Peripheral Vision department.

### SPECS

DISPLAY SIZE: 36 in. diagonal  
RESOLUTION: 1024x768  
WEIGHT: 200 lbs.  
DIMENSIONS: 32.5w x 26.6h x 22.25d

### MAXIMUM PC VERDICT

Princeton AV3.6  
PRINCETON GRAPHICS

### WHAT WE LIKE

Very bright, so it's suitable for almost any room. Inputs for everything. Great for gaming.

### WHAT WE HATE

Distortions around the corners. Abysmal dot pitch. Crappy remote control. Very, very heavy at 200 pounds.

PHONE: 800.747.6249  
WWW.PRINCETONGRAPHICS.COM

**\$3,000<sup>00</sup>**

**7**



# LCD PROJECTOR

**L**CD-based projectors are capable of serving double-duty as computer displays and movie projectors—if you're aware of a few minor problems from the get-go.

**HOW IT WORKS** Liquid crystal display (LCD) projectors shine a very bright light through a small, transparent LCD panel. The image produced by the LCD is focused onto a screen by a series of lenses. (For a full explanation of how a liquid crystal display works, visit [www.howstuffworks.com](http://www.howstuffworks.com).)

**THE UPSIDE** Though none of the major LCD manufacturers are really pushing their products for use in home-theater and gaming environments, the relatively inexpensive projectors are really well-suited for the task. Most LCD projectors run between \$4,000 and \$5,000, and are more than capable of displaying DVDs, HDTV, and computer-generated images. Their light weight and portability make them easy to mount in almost any room, and—unlike rear-projection sets—the size of the displayed image is only limited by the length of your room, the size of your screen, and the brightness of the projector.

**THE DOWNSIDE** In order to produce a visible picture, the projector must be located in a fairly dark room. Bulb life is also a major consideration. Projector bulbs are rated for between 1,000 and 2,000 hours of use, depending on the brightness settings used. This means you could be changing the bulb—which costs several hundred dollars—as frequently as every three months.

**THE BIG PICTURE** If you're looking to spend less than \$10,000 for a large-screen experience and don't have room in your living room for a big, heavy CRT, a front-projection setup is probably the way to go. But if you're planning to use the projector as your main television-viewing source, be prepared to ante up for light bulbs on a regular basis.

Before you buy a projector, be sure that it's capable of serving as both a PC display and a home theater projector. There are cheaper projectors available, but they don't support HDTV resolutions, can't change their aspect ratio to display widescreen images, or are so large that they'll have to be professionally installed.

The VT540's bulb gets hot enough to require a constant flow of air through dedicated vents.



The VT540's control panel allows you to manipulate seemingly every quality of the display, from aspect ratio to color balance.

The VT540 includes four remote-control inputs—one on each side—so you can use the included remote from anywhere in the room.

## NEC MULTISYNC VT540

*Bring a ray of light to your home theater*

**T**hough touted by NEC as a business projector suitable for corporate presentations, the NEC Multisync VT540 shouldn't be discounted for home-theater and gaming use. It's more than capable of displaying DVDs, TV, and anything that your computer tosses at it—and displaying it very well. The VT540's bright light can project an image up to 30 feet away in a well-lit room, and can produce an image as large as 120 inches across. Talk about a theater in your living room.

We appreciate the fact that NEC includes VGA, S-video, and composite connectors on the VT540, but were a little perturbed by the need for a special cable (not included) to connect the display to DVD players or HDTV receivers that use component outputs. Granted, once the cable was in place, everything worked as it should. And image quality on the VT540 is excellent. The LCD-based display exhibited no color distortion, and the entire display put forth picture-perfect geometry (as is to be expected with any LCD-based product). Of course, as with all front projectors, you need

a relatively dark room in order to fully appreciate the picture.

The main problem with any projection system that uses a bulb as a light source is bulb life. The bulbs used in the VT540 are rated for a 1,000-hour lifespan when used at maximum brightness, and a 2,000-hour lifespan when used at 80 percent of maximum brightness. Because the bulbs cost several hundred dollars, this can be an expensive prospect, especially if you plan to use the projector for day-to-day TV watching.

Like most superb products, the VT540's qualities come at a price—a steep one. If you're making a serious commitment to your PC entertainment center—so much so that you've, perhaps, dedicated a room to it—the VT540 is more than worth your consideration, because it's well-equipped for computing, gaming, and enjoying movies. If, on the other hand, you're in the market for a decent, large-size monitor that you can also use for watching DVD movies and playing an occasional game, you might be better served by another type of display.

### SPECS

DISPLAY SIZE: variable  
RESOLUTION: 1024x768  
WEIGHT: 8.6 lbs.  
DIMENSIONS: 9.6w x 4.0h x 11.2d

### MAXIMUMPC VERDICT

MULTISYNC VT540  
NEC

### WHAT WE LIKE

Great picture. Vibrant colors. Portable. Geometric accuracy. Projects largest image of any display we looked at.

### WHAT WE HATE

Doesn't work in bright rooms. Expensive bulbs must be replaced frequently. Requires a screen for decent viewing.

PHONE 800.632.4636  
www.nec.com

\$5,000.00

8



**P**lasma-screen technology suffers from a few problems, not the least of which is that it's damned expensive. But the drawbacks barely detract from the extraordinary delight that comes from having a 50-inch screen in five-inch-thick packaging hanging on your wall.

**HOW IT WORKS** Plasma displays are comprised of thousands of small cells that contain an inert gas. Each cell makes up one pixel of the display. When an electric current is applied to a cell, it excites the gas, which then emits light. By altering the strength and duration of the current, it's possible to manipulate the color that each cell displays.

**THE UPSIDE** If you're trying to fit a big-screen display into a small space, plasma's for you. If you want a display that's great for general computing, watching DVDs, and playing games, plasma's for you. If you want a display that will make your neighbors green with envy, plasma's for you.

**THE DOWNSIDE** Plasma displays can't compare to rear-projection CRTs for rendering the black portions of images. But the difference is subtle and shouldn't greatly affect one's appreciation of most movies and games. The real problem associated with plasma is cost. Though we've seen prices drop significantly on 40-inch, 4:3 displays, the lowered cost is still pretty astronomical (the Pioneer reviewed on this page will set you back \$9,000). The 55-inch version costs almost as much as a Honda CR-V.

It's also worth addressing what can only be called an urban legend—that the plasma can actually leak from your plasma display and poison you. We've spoken with several vendors and received the same answer from them all: Plasma displays contain tiny amounts of actual plasma (an inert, non-toxic gas) that are permanently sealed in the tiny cells in the display. The only way to release the plasma would be to break the glass on the front of the plasma monitor. That stated, shipping companies and trade show vendors told us that these displays are a little more fragile than the vendors let on.

**THE BIG PICTURE** If you can afford the cost of entry, plasma provides a great viewing experience in a compact package.

The V402's display is made up of thousands of tiny cells that contain an excitable gas. When an electrical current is applied to the cells, the gas emits light.



All the necessary controls for the V402 are hidden on this side panel.

The V402 includes feet for desktop mounting, but wall mounts are also available.

## PIONEER PDP-V402

*If it sounds too good to be true, it probably is*

**W**e like plasma. Plasma displays make big, pretty pictures, but are slim and light enough to hang on the wall (with a little structural work, of course). The only thing we don't like about plasma is its price, which is why we were initially shocked by the V402's relatively reasonable cost.

Until we found out that its native resolution is only 640x480.

Granted, the V402 looks absolutely terrific at its native 640x480. But it doesn't even include a built-in scan converter to dither higher resolution signals down to its native resolution. If you're planning to use this display at any resolution above 640x480, you'll need to pick up a PDA-4003 scan converter from Pioneer (\$995).

Equipped with the scan converter, the V402 is a decent gaming display with relatively good black levels (for plasma) and great color consistency across all portions of the screen. Dithering 800x600 signals down to 640x480 results in an

almost imperceptible loss of quality in games. Dithering 1024x768 gaming signals is also perfectly acceptable. However, regular old text doesn't fare nearly as well. With 800x600 signals, the dithered image is good enough for web browsing and e-mail reading, but at 1024x768, dithered text becomes a headache mess.

Thankfully, the nature of plasma technology precludes the possibility of weird geometric distortion anywhere on the screen. The Pioneer plasma is acceptable for DVD viewing, although its low resolution puts the kibosh on HDTV viewing at true high-definition resolutions.

We can't recommend buying a V402 for day-to-day computing use. Though the scan converter is the best we've seen, \$9,000 is too expensive for an 800x600 display. If you absolutely must have a plasma display, shell out a little more cash and purchase either the Pioneer PDP-502MX, which we featured in the November 2000 issue, or the Hitachi CMP4120H DU.

### SPECS

DISPLAY SIZE: 40 in. diagonal  
RESOLUTION: 640x480 (1024x768 w/ scan converter)  
WEIGHT: 66 lbs.  
DIMENSIONS: 37.2w x 29.13h x 3.94d

### VERDICT

PDP-V402  
PIONEER ELECTRONICS

### + WHAT WE LIKE

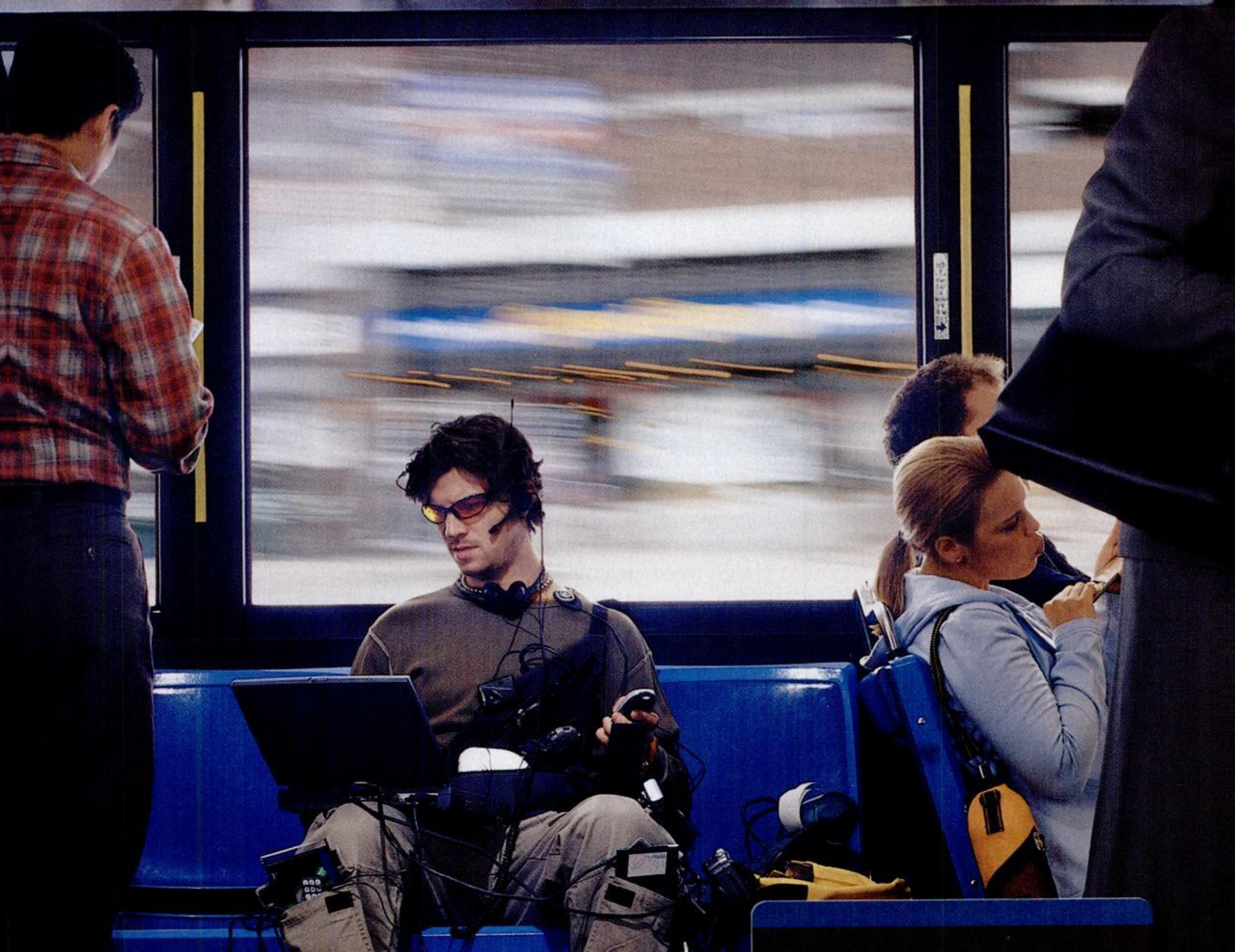
Plasma's inherent technology strengths. Great picture. Bright colors. Plenty of connectors.

### - WHAT WE HATE

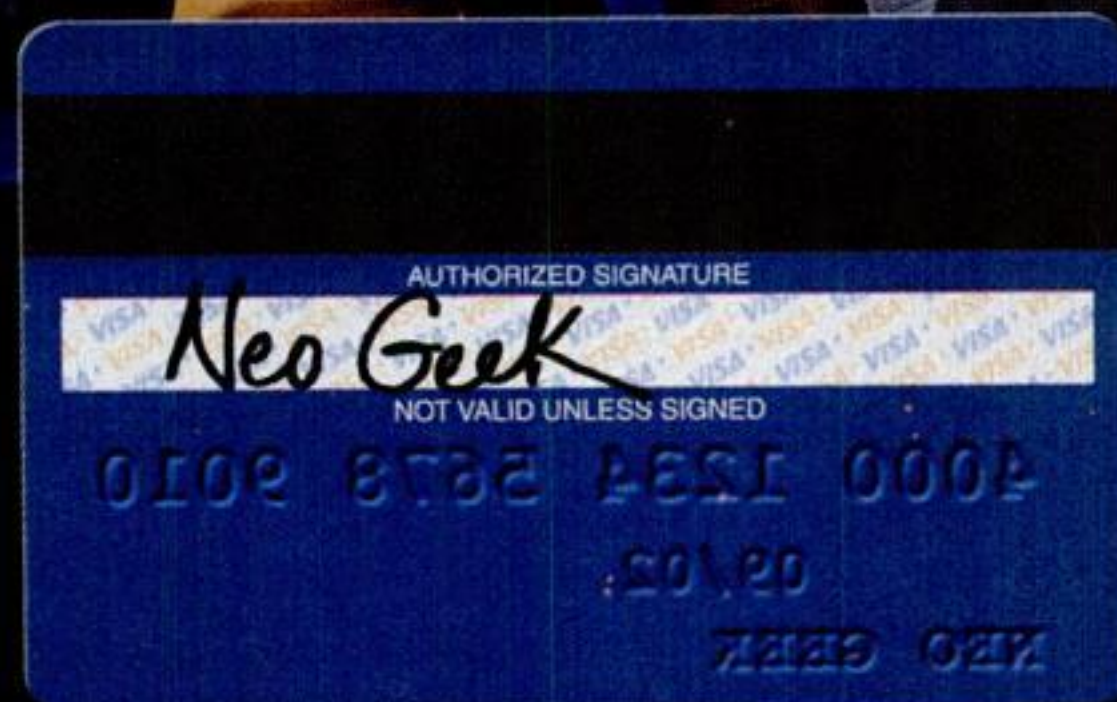
NASA pricetag. 640x480. 'Nuff said.

PHONE 800.935.0329  
WWW.PIONEERELECTRONICS.COM  
**\$9,000.00**





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# REAR- PROJECTION CRT

Large monitors—such as the Princeton on page 48—aren't the only displays that house cathode-ray tubes. Deep within the heart of a modern rear-projection TV lies not one, but *three* CRTs. **HOW IT WORKS** Rear-projection displays send an image from a very bright light source through a series of lenses and mirrors (or "optics") and project that image onto a screen—hence the "rear-projection" moniker. The source of the image is a CRT. But, unlike a regular-size set, most rear-projection TVs employ three separate CRTs: one each for green, blue, and red. The images from each CRT are manipulated by lenses and mirrors to make a single image on the back of the screen. The bigger the CRTs, the better the image, so most manufacturers use CRTs that are between seven and nine inches across, diagonally.

**THE UPSIDE** For around \$3,000, you can pick up a 55-inch widescreen HDTV—that's more expensive than a large direct-view CRT, but for the price, you get a rear-projection TV that will really shine for all your TV-viewing needs. All this and a great gaming and DVD-watching experience to boot.

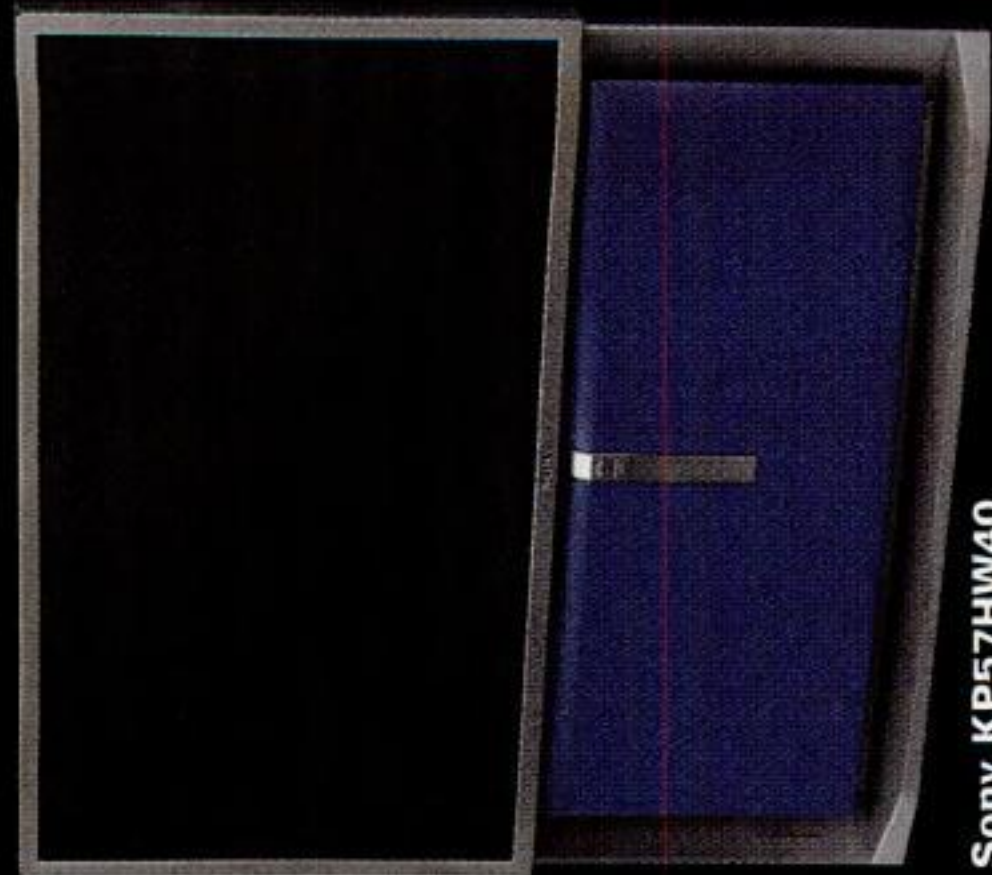
**THE DOWNSIDE** Unlike direct-view CRT sets, CRT-based projection displays are more than capable of burning an image into one or more of the CRTs. If you plan to connect a computer to one of these sets, we strongly

recommend that you set your screensaver for two minutes, remove all stationary images from your desktop, and hide the Taskbar below the bottom edge of the screen. You don't want to see those while you're watching movies, do you?

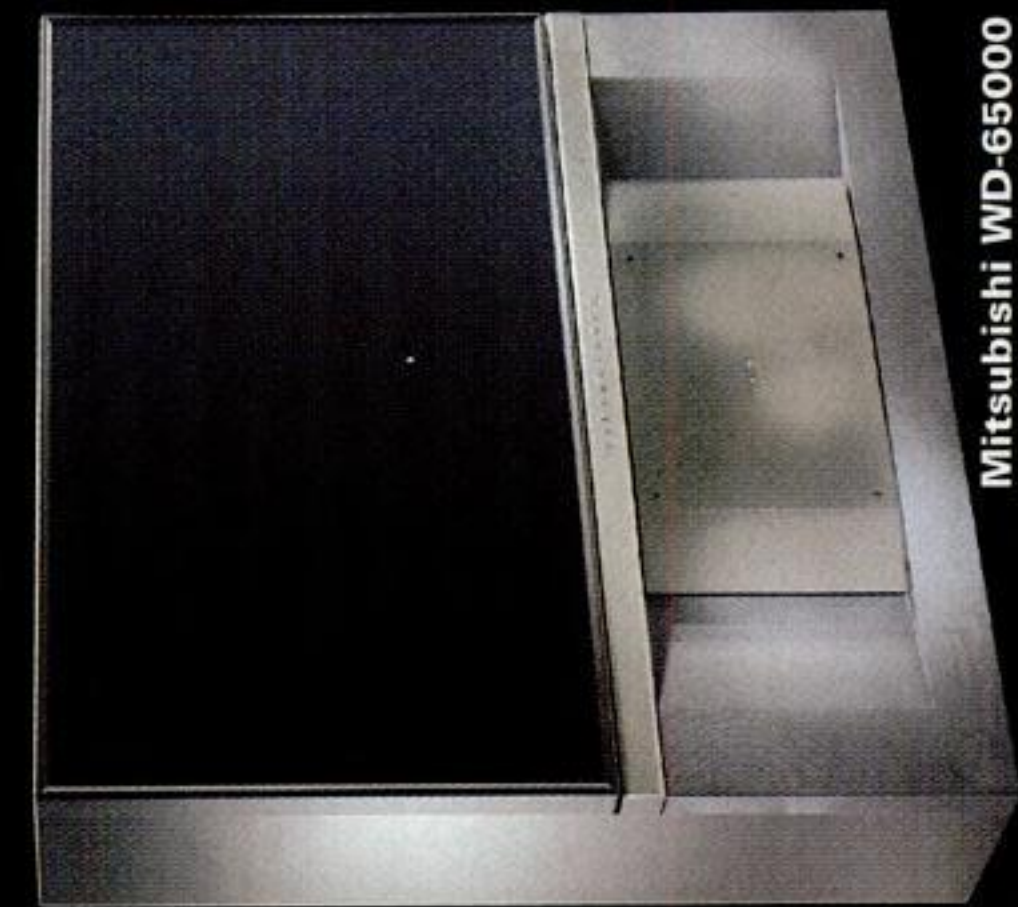
Unless your rear-projection CRT is designed to accept a PC's video signal, you'll need a video card that's capable of pumping a Colorstream-compatible component signal, which is used by HDTV set-top tuners to output a high-resolution signal to the HDTV. Though ATI and nVidia claim HD-resolution support for their existing cards, when we asked to see the HD features in action, neither company was able to deliver.

**THE BIG PICTURE** While rear-projection CRTs make great TVs, we have a tough time recommending them as monitors. They're huge (a 55-inch set is 28 inches deep), typically lack the appropriate connectors, and the possible desktop burn-in could be devastating.

However, if what you really want is a massive screen on which to play *Quake III*, the rear-projection CRT is right up your alley. If you decide to make a purchase, pay attention to the CRT size (bigger is almost always better) and the lens and mirror quality—look for front-surface mirrors, because rear-surface mirrors can cause weird ghost images to form.



Sony KP57HW40



Mitsubishi WD-65000

# REAR- PROJECTION DLP

DMD does this so quickly, each pixel can produce whatever colors are necessary.

**THE UPSIDE** If it all sounds very complex—well, it is. But the practical upshot is that DLP sets are much better suited for TV viewing and computer use than anything but plasma. DLPs won't burn-in like rear-projection CRTs, and they produce much brighter images than LCD projectors. Because they don't have to include bulky CRTs, DLP rear-projection sets are much thinner and lighter than their CRT brethren.

**THE DOWNSIDE** The only real downside to DLP technology is its price—but that constitutes one heckuva downside, unless your pockets are so fat that you have to flatten them down with a dough roller. Considering that each DLP chip has around 750,000 moving parts, they aren't cheap to make. Factor in the cost of the optics and mirrors, and even the cheapest DLP set will cost you well over \$10,000.

**THE BIG PICTURE** Although DLP-based displays are considerably more expensive than similarly sized CRTs, we expect the price of the actual DLP to come down considerably in the next two years. Eventually, DLP sets might even cost less than rear-projection CRTs. While DLP sets won't replace small CRTs, the days of the projection CRT are certainly numbered. ■

Until now, the only rear-projection game in town was CRT-based—and CRTs' burn-in tendencies make them inappropriate for daily computing use. Though they're considerably more expensive than comparably sized CRT displays, a new breed of rear-projection screens is trickling into home-theater specialty shops. Digital light processor (DLP) displays relieve many of the problems inherent in CRT-based rear-projection screens. But they'll cost ya.

**HOW IT WORKS** Lights and mirrors. The DLP is essentially just a fancy light-and-mirror rig, but the new technology delivers the first real revolution in display technology since the LCD panel was invented.

The DLP consists of two main components: a microchip-size digital micromirror device (DMD) containing 750,000 microscopic mirrors (each of which can move 50,000 times per second) and a microchip capable of controlling the DMD. Each mirror represents a single pixel in the image it produces. An image is created by aiming a light source at a single DMD. Thousands of times each second, that light source shifts between the colors red, blue, and green. When the light source is projecting green, the mirrors for each pixel that should be green reflect green onto the screen. The



# **D2P**

***Design 2 Play***



[www.elsa.com](http://www.elsa.com)



*Maximum PC proudly presents...*

*The First Annual Awards for*

# *Shame & Grandeur in PC Gaming*

**T**he minutiae. The little stuff. The fascinating details you remember long after you've uninstalled the game. *This* is the stuff that PC games are made of. Everything from the deafening reverberation of your favorite deathmatch weapon to the unforgivable AI glitch that always seems to ruin your touchdown drives. These are details that give games life. These are the details we revel in when we're reminiscing about the highlights and lowlights of past gaming exploits.

And so we give you an awards show unlike any other. We surveyed our collective PC gaming experience over the last 12 months and created a list of awards that exposes the most compelling details of the most noteworthy games. Some of the awards applaud great efforts, others slam dismal failures, and still others simply comment on what certain titles mean to the Big Gaming Picture. So jump in and swim in the details. Disputes and additions should be sent to **[editor@maximumpc.com](mailto:editor@maximumpc.com)**.



## BEST SKELETAL ANIMATION:

### Heavy Metal: FAKK 2

Playing as the ambidextrous Julie, you can simultaneously wield two weapons, one in each hand. But here's the kicker: The game developers who gave you the gift of movement also gave you the ability to wield your weapons in different ways depending on the combination of arms you're holding. So during the course of fighting, you'll see umpteen different weapon animations—and this awesome variety simply wouldn't be possible if the developers used old-school keyframe animation.

## BEST DEFORMABLE TERRAIN:

### Giants: Citizen Kabuto

The explosion resulting from a pop-up bomb creates a rippling shockwave across the ground, knocking any enemy off its feet. Keep in mind, folks, these are polygons we're talking about. They don't move that way without tightly written code and considerable computing power.

## WEAKEST DIABLO RIP-OFF:

### Diablo II

Fans scooped it up in record numbers. Critics got down on bended knee to worship it. And for what? A barely improved, three-year-old, low-res engine and a skill tree? *Diablo* was an entertaining but simplistic game that lacked the depth a sequel could have offered. But now, with *Diablo II*, we find ourselves madly clicking our mouse buttons to stomp out mediocre-looking monsters. Fans deserve better after waiting three years.

## BEST USE OF 3D POSITIONAL SOUND:

### Thief II

In one mission, Garret, the protagonist, has to eavesdrop on



## MOST EXCESSIVE USE OF PARTICLE EFFECTS:

### Sacrifice

Ooo! Shimmering energy fields! It appears the *Sacrifice* developers attached particle effects to every creature and action in the game. Unfortunately, like the lens flares in *Unreal* and the colored lighting in *Quake II*, even pretty, pretty particle effects can grow old when you see them in every single frame.

a conversation through a door. Shift his stance and the volume of the conversation shifts in perfect accordance. And the enemies? Just by listening to their footsteps, you can determine where they're going, what they're walking on, and what kind of shoes they're wearing. As for your own noisy boots, they're a dead giveaway on those dratted stone floors.

the distance? You can climb them if you have the time. *Project IGI* might even have more play area than *Falcon 4*.

## THE LEWIS AND CLARK AWARD FOR LARGEST GAMING ENVIRONMENT EVER:

### Project IGI

In simple terms, you could put a book on the walk-forward key, step away from your PC, go to bed, and your character *still* won't reach the edge of the world by the time you wake up in the morning. See the mountains off in



## BEST SINGLE 3D MODEL:

### Kabuto from Giants: Citizen Kabuto

With 5,366 polygons and perhaps the largest relative mass of any carbon-based organism in gaming, Kabuto has enough spikes, protrusions, and rippling muscles to bring all but the most powerful PCs to their knees. And these spikes aren't merely decorative. Kabuto can grab a vimp (a sheep-like source of food) and impale it on one of his spikes for future consumption. Mad vimp disease or not, Kabuto doesn't miss a meal.



THE SHOULD-HAVE-BEEN-IN-THE-BOX AWARD:

## Team Arena

The only elements this expansion pack added to *Quake III Arena* were a few extra game types that should have been included in the original box, a few crappy models that pale in comparison to those in the original, and runes. And who gives a damn about runes? Viking berserkers? Newsflash: *The Vikings are dead.*

BEST "UNAUTHORIZED" MOD:

## Falcon 4

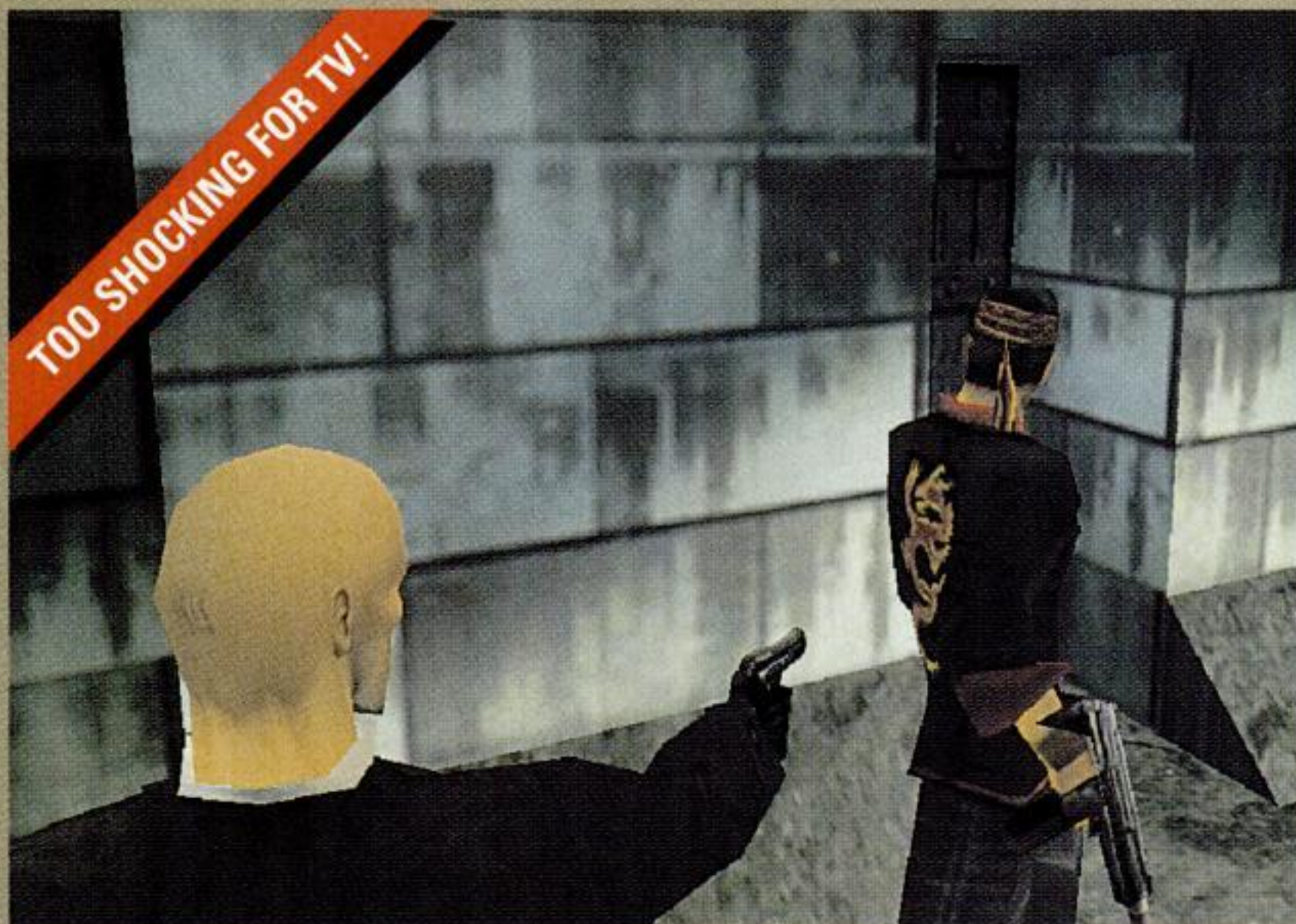
When the *Falcon 4* team was summarily dismissed, the source code made its way onto the Internet. Odd. How could that have happened? Needless to say, flight sim fans—all four of them—were stoked.

MOST INTENSE PATHING IN AN UNREAL ENGINE-BASED GAME:

## Deus Ex

Accomplishing what was once thought to be out of the question, Ion Storm managed to get the boats in the game to execute sweeping cinematic turns—which anyone who's ever wrestled with the *Unreal* editor's rudimentary pathing scheme knows to be damn near impossible.

TOO SHOCKING FOR TV!



BEST SHOT TO THE HEAD:

## Hitman

Normal games let you shoot enemies in the head. Standard gaming fare. We've all been there. But *Hitman* offers a visceral experience unlike any other. It's the sound, it's the element of surprise, it's the chunks of brain and skull that lie in your wake.

COOLEST ENVIRONMENT TO WANDER AROUND IN—IN AN OTHERWISE LINEAR GAME:

## Alice

*One path takes you farther/And one path butts against a wall./And most paths that McGee gives you/Don't lead anywhere at all./Go play Alice—unless you simply want to troll.*

Those are the opening lyrics to our hit psychedelic anthem. It's called "Alice Is a Really Fun Game with Awesome Art Direction, Particularly the Indoor Levels in the Creaky, Spooky Mansion, but It's a Shame the Entire Game Is

Just So Damn Linear, Because We'd Really Love to Have Some Legitimate Motivation to Wander Around in Wonderland When We're Not Actually Trying to Solve the Over-Archiving Puzzle." Catchy, huh? We think this tune is going to be a big, big hit.

MOST POWERFUL WEAPON:

## The Thunderbolt from Mechwarrior 4

It's a weapon so potent, it's automatically disabled in multiplayer. Launch this shell

and you've never seen such an explosion. Want to level a city block? Thunderbolt it. In fact, we think the Thunderbolt is so powerful, it could even take out a light cruiser in *Descent Freespace*—or vaporize an entire *Quake III* map. Those Mechs, after all, are hard-ass mothers.

MOST UTTERLY, COMPLETELY, TOTALLY DEAD GENRE DESPITE THE CONTINUING RELEASE OF STRONG TITLES:

## Flight Sims

Where have all the soldiers gone? Solid titles such as Rowan's *Battle of Britain*, MicroProse's *B-17 Flying Fortress II*, and Microsoft's *Combat Flight Simulator II* all sank without a trace. Only the arcade-like *Crimson Skies* attracted any attention. Younger gamers are simply rejecting the steep learning curve of these complex dinosaurs, almost guaranteeing a flight-sim-free future for the Geritol crowd.

MOST PISS-YOUR-PANTS SCARY GAME:

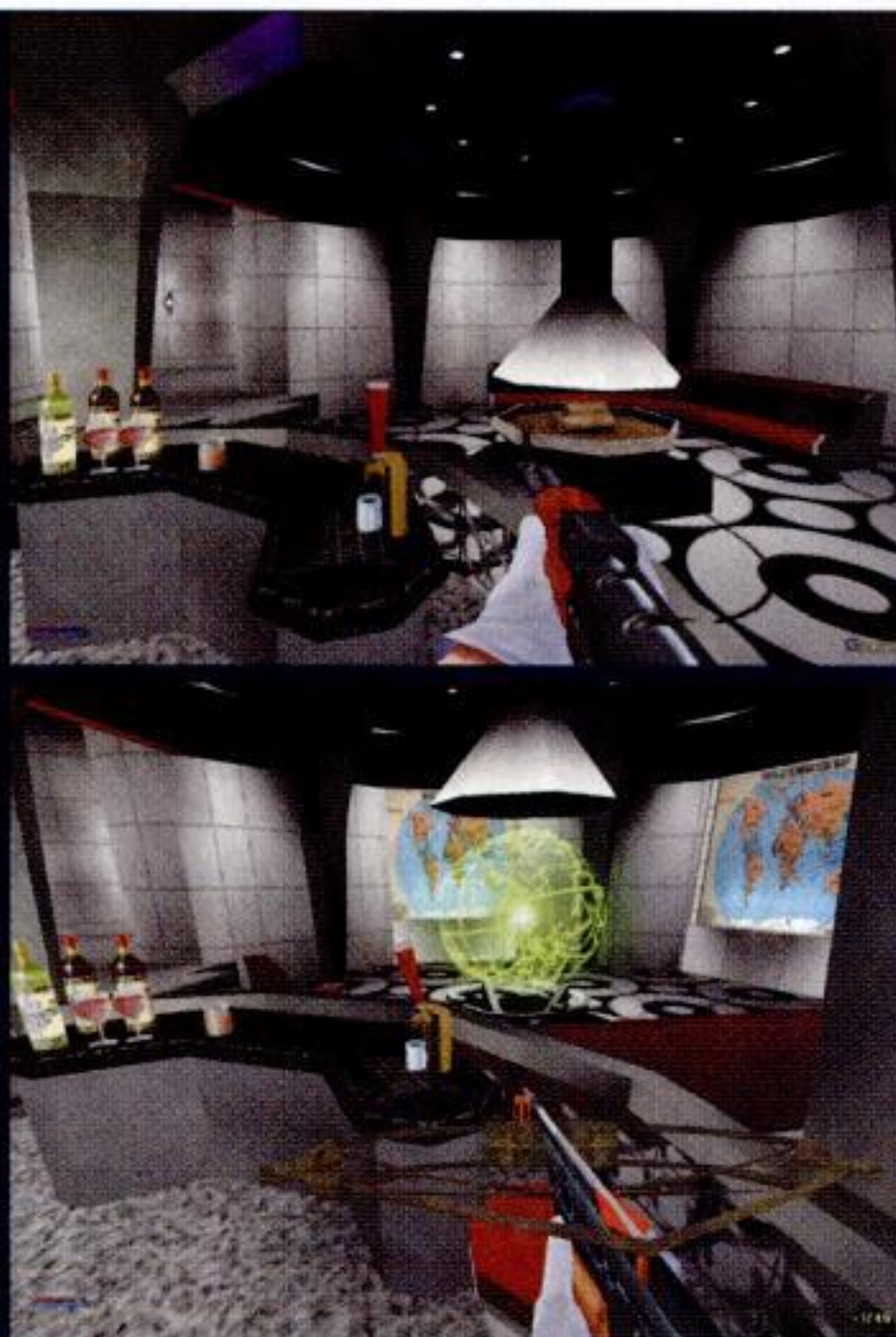
## Undying

Fear is hard to convey in a game with only polys and textures at your disposal. *Doom* had it. *System Shock* had it. And *Undying* has it—big-time. With its floating phantasms and occasional glimpses of past horrors, it maintains a consistently creepy atmosphere. At the same time, fast-moving, heavily-clawed, or wildly-tentacled monsters

BEST SET DESIGN:

## No One Lives Forever

Like the kitschy British spy films it so deftly mimics, *NOLF* is chock full of elaborately cheesy sets—German nightclubs, Moroccan hotels, orbiting space stations. Surely you've seen Peter Sellers or James Coburn in these locales before. One of our favorite *NOLF* sets is the pop-art lounge in the Baroness' Lair. Pull the beer tap and the set transforms into a war room. We especially like the cozy wood-burning stove that turns into a holographic globe. Perfect for world domination!





**BEST  
BREASTS:**

## Heavy Metal: FAKK 2

In the console fighter *DOA*, breasts jump and jiggle like Jell-O. PC gamers, meanwhile, have had to make due with more stately bosoms, with Lara Croft's Russ Meyer-size melons setting the gold-cup standard. But wrapped in pleather and looking pleasantly proportional rather than Croftily inflated, Julie of *FAKK 2* makes a fine impression.



**MOST IMPROVED LICENSE:**

## Star Trek

Once the imprimatur of utter shite, the Star Trek license had nowhere to go but up after steaming turds like *New Worlds*, *Borg*, and *Hidden Evil*. It clawed its way to mediocrity with *Klingon Honor Guard*, then did the unthinkable and created a great game with *Elite Force*, as well as some good ones with *The Fallen*, *Klingon Academy*, and *Starfleet Command II*. Despite backsliding with the passably decent *Away Team*, it looks like the franchise is ready to violate the prime directive by introducing decent Trek gaming to a primitive civilization.

**THE WE-FINISHED-IT-BEFORE-WE-  
GOT-IT-OUT-OF-THE-BOX AWARD:**

## Elite Force

While we're on the subject, what was the deal with the playing time of *Elite Force*? No question, it was a great experience with terrific scripting and non-stop action, but it was also over far too soon. Sure, there were plenty of levels and things to shoot, but they all seemed shorter than normal action levels. Must be that space-time continuum thingie.

**MOST UNNECESSARY 3D-  
ACCELERATION REQUIREMENT:**

## Diablo II

It's a 2D environment. *It's a 2D environment*. So why have a 3D requirement in a sprite-based game? Because the developers used hardware acceleration for lighting effects, even though 2D effects would have been wholly acceptable. So why require

**BEST DIALOGUE:**

## No One Lives Forever

This campy, swinging '60s action-adventure has the best dialogue of any electronic game, hands-down. *NOLF's* very best exchanges are between H.A.R.M. employees—their ironic chatter reminds us that even evil henchmen are just 9-to-5 working stiffs like the rest of us. Here are Bain and Ambrose talking about their boss:

**Ambrose:** You seen Stinks lately?

**Bain:** Who?

**Ambrose:** Phillips. You seen him?

**Bain:** Not in the past 20 minutes or so.

**Ambrose:** Damn, where the hell is he?

**Bain:** What did you call him?

**Ambrose:** Stinks? You never heard that?

**Bain:** No! That's hilarious!

**Ambrose:** Yeah, everybody calls him that.

**Bain:** He does stink. Anybody who smokes that many cigarettes a day definitely needs to bathe more than once a week.

**Ambrose:** I'd hate to see the bath water when he gets out. It probably looks like an oil slick.

**Bain:** It's like that Dr. Seuss book. The one where the cat leaves the ring in the bathtub and he ends up getting it all over everything.

**Ambrose:** That's a great story.

**Bain:** (After a beat.) Stinks. That's just so perfect.

pop out of shadows with such alarming speed, they push the jump factor to 11. Change of shorts not included.

**BEST ARGUMENT FOR GAMERS  
GROWING A THIRD HAND:**

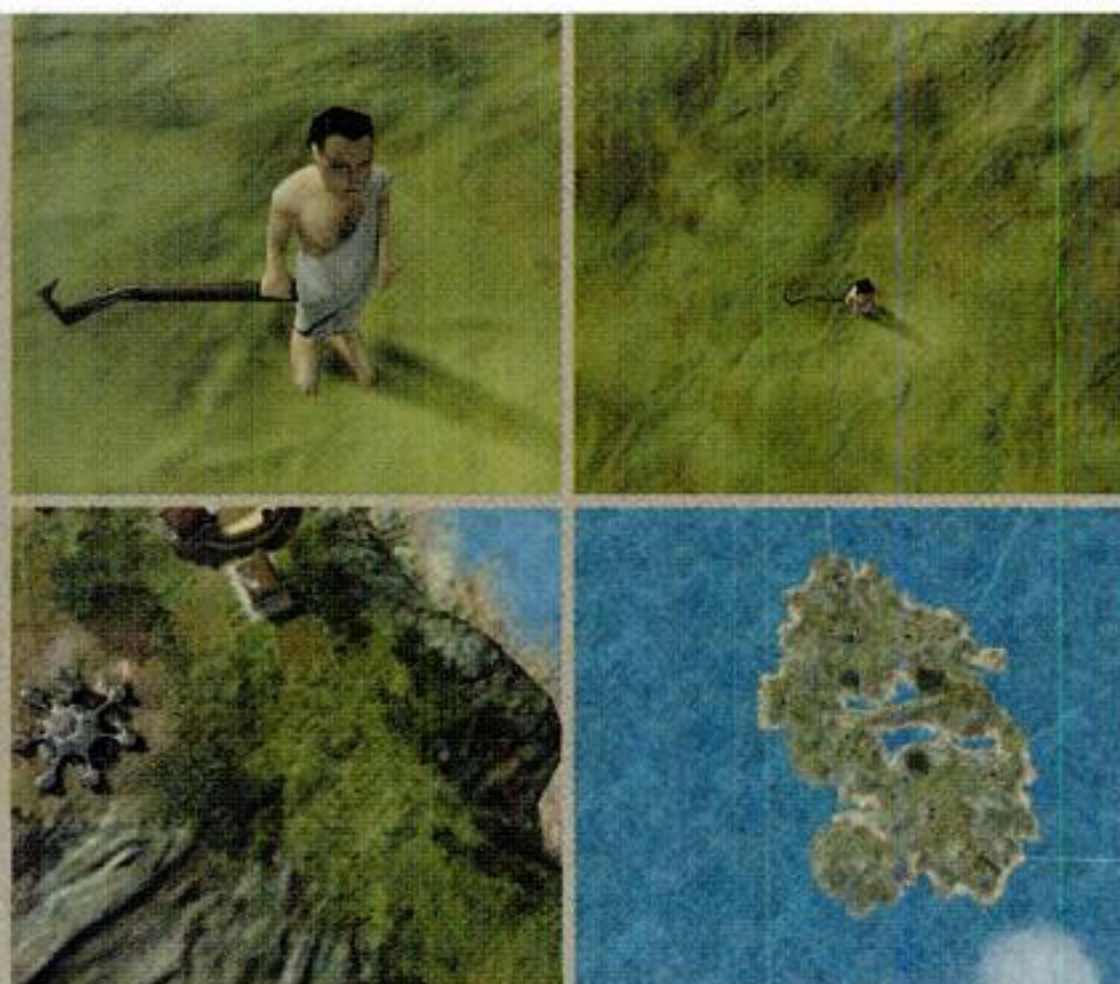
## Sacrifice

Shiny taunted us by including multi-limbed critters in its brilliant RTS/action hybrid and then challenged us to move our character, change the camera angle, cast spells, order units, drink a beer, and scratch ourselves with only two hands. We've always wondered where evolution might generate a third arm. We're guessing Utica.

**BEST SENSE  
OF SCALE:**

## Black & White

Looking for a feeling of omniscience? With the sweep of your mouse, you can zoom from a close-up of an eyebrow to a low planetary orbit that lets you see the entire world on one screen. Indeed, what if God were one of us?





**LEAST REQUESTED SEQUEL:**

**Carnivores: Ice Age**

Despite being a budget-line hunting game from WizardWorks (the official kiss of death), *Carnivores* actually boasts a decent engine and passable gameplay (hey, it's more entertaining than *Trespasser*). By *Carnivores II*, however, the formula had worn thinner than a mu-shu pancake. Now, with *Carnivores: Ice Age*, we have descended into the Toilet Zone, with endless expanses of bland, winter landscapes and dinosaur targets so scarce you'd think they were extinct or something.

**THE OK, REALLY, YOU CAN LEAVE ANY TIME NOW AWARD:**

**Lara Croft**

She has become The Thing That Wouldn't Leave, dragging us kicking and screaming through five increasingly threadbare outings. We're tired of staring at her low-polygon-count ass, tired of her tedious jumping puzzles, tired of her terrible aim, and, most of all, tired of the crummy programming and clipping problems that would shame a 16-year-old hacker. Take your games, your movie, your t-shirts, and go away!



**BEST LIGHTING EFFECTS:**

**Blade of Darkness**

The first time you pick up a torch, it casts a shadow on the other side of the room. There are no straight edges, no weird joints, no polygon overlap—it's just a shadow. Just like real life. Throughout the game, the lighting is so true to reality, you actually have to adjust to its appearance. You've never seen such sublimity in a PC game.

3D? Uh, because it's a hot buzzword to put on the product box?

**WORST SECURITY IN A HIGH-SECURITY COMPLEX:**

**Deus Ex**

You're an operative. You're interviewing an NPC named Agent Navarre. You finish the discussion, and Agent Navarre tells you to get the hell out of her sight. She must be kidding, right? She must be, because you can walk right by her, hack her computer, and begin collecting data—and she just stands there and stares into space! In fact, all the NPCs in this game are incompetent. So much for union labor.

**BEST USE OF AN AK-47:**

**Counterstrike**

Nothing strikes more fear in your heart than to come around a blind corner and run smack-dab into a terrorist with a dreaded AK-47 on full auto. A heartbeat later, as you hear the throaty roar sounding off, you know those 7.62mm rounds have already ripped through your body armor. All of the firearms in *Counterstrike* can be identified by sound alone, and the report of the AK-47 says "you're dead" like no other weapon.

**MOST PATHETICALLY BETA FINAL RELEASE:**

**Fallout Tactics**

When a developer releases a 75MB patch mere days after the game's retail

debut, there's really nothing left to say—except, "Woo! Woo! Who let the beta out? Woo! Woo! Who let the beta out? Woo! Woo!..." How incomplete was the final release? It was actually missing textures for large portions of the game. Oops. Looks like the *Fallout Tactics* QA team was playing *Quake III* instead of *Fallout Tactics*.

**BEST AI:**

**Black & White**

Welcome to "adaptive behavioral AI." You can teach your creature to do anything through positive and negative reinforcement. Unfortunately, we taught our creature to crap on farmers. Yes, that's right. We inadvertently taught it to poo on the poor sods. Not a pleasant story. But it does reveal the power of *Black & White's* AI engine. ■



**THE "GIRL, INTERRUPTED" AWARD FOR SELF-MUTILATION IN WONDERLAND:**

**Alice**

Is she just curious or deeply troubled? If you remain completely stationary in *Alice* for more than 30 seconds, the troubled waif will take whatever weapon she has in her hand and inflict a little masochistic damage. Twisted? Yes. But in such a clever, clever way. *Alice* has gallows humor in spades.

"I'll have to shuffle my cards more carefully next time—I seem to have given myself a paper cut."





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# Ask the Doctor

Symptom → Diagnosis → Cure

Even the burliest of PCs comes down with a bug every now and then. That's when you need to call The Doctor and get a diagnosis that'll have you up and running in no time. Send your symptoms to: [doctor@maximumpc.com](mailto:doctor@maximumpc.com). Unfortunately, The Doctor cannot personally respond to every individual letter.

## Burning Question

I've compared your reviews of the 16/10/40 [April 01] and 12/10/32 [January 01] versions of the TDK VeloCD. Do I understand correctly that the 12/10/32 will make a game backup by reading subchannel data, but that the 16/10/40 will not? I'm about to buy a burner and this could be the deciding factor. The PlexWriter 16/10/40 would be great, but purchasing Nero 5 would cost an additional \$70.

—Connie Tanaka

Sorry about the confusion, Connie. Both versions of the TDK VeloCD we reviewed are capable of reading and writing subchannel data. The subchannel is used to store specialized information, such as CD-text and the subtitles in karaoke CDs, and is also pressed into service by a number of sly copy-protection schemes.

The VeloCD and PlexWriter drives also support reading and writing in RAW mode, which is analogous to copying text in a foreign language, letter for letter, without actually understanding what you're copying. If you want the

and 98 but not in WinME or Win2000 (which dropped real-mode DOS support altogether). But due to its many limitations, such as a 16MB limit in size and unreliable support for long filenames, RAMDRIVE doesn't get invited to many parties anymore.

So why even consider RAMDRIVE? Some power users running older machines with a



**RAMDRIVE is assigned a drive letter and a festive chip icon at boot-up.**

bit of extra RAM might be able to benefit from the utility by assigning the Windows TEMP directory or browser cache to the RAM disk for faster access times. To activate RAMDRIVE, use a text editor to insert these lines into your config.sys:

```
DEVICEHIGH=C:\WINDOWS\HIMEM.SYS
DEVICEHIGH=C:\WINDOWS\EMM386.EXE ON MIN=16384
DEVICEHIGH=C:\WINDOWS\RAMDRIVE.SYS 16384 /E
```

This will establish a 16MB RAM drive loaded into extended memory. Your drive will be assigned a drive letter and show up in My Computer as MS-RAMDRIVE. You may also want to confirm that your CD-ROM drive letter is reserved, so it doesn't get reassigned a new letter when RAMDRIVE moves into the neighborhood. And while you're experimenting, don't forget that you're still using RAM—if you shut down, restart, or lose power, all the data on your RAMDRIVE will be lost.

If price is no object and you really want to set your *Photoshop* scratch disk on fire, check out the QikDrive from Australia's Platypus Technology. It's essentially a storage drive fueled by RAM—512MB of capacity and a throughput of 110MB/sec for \$1,500. Ouch!

## Nothing Installs from CD

I recently bought an Iomega Zip drive, and last night I tried to install the software from the CD. When I clicked the setup icon, I got the following message: "Isset\_se

An error has occurred in your program. To keep working anyway, click Ignore, otherwise click Close." I tried clicking Ignore, but the setup program just hangs for a while and eventually quits. However, when I copied the Iomega

software to the hard disk and then installed it from there, it worked fine.

At first I thought that it might have been a problem with the Iomega software, but I tried installing *Half-Life* and *Need for Speed 3* from CD and had the same problem. I have installed and played these games on my PC

before. I am completely at a loss as to what is going wrong.

—Arnav Mandal

Installation problems that aren't specific to one program are almost always caused by software running in the background. Disabling your antivirus software by right-clicking its icon in the System Tray and selecting "disable" should fix the problem. If this doesn't work, disable the Point32 and/or Mswheel programs by pressing Ctrl+Alt+Delete, highlighting these programs, and clicking "End Task." Feeling better?

**For the best possible odds of successfully backing up your games, you need a drive capable of reading and writing subchannel data.**

best possible odds for successfully backing up your games, you'll need software, such as *CloneCD*, that supports RAW mode reliably.

## RAM Drives in Windows

Now that RAM is so cheap, is it possible to make a virtual hard drive using RAM, one that Windows would recognize as a regular drive and use as a scratch disk or maybe to launch applications? Imagine booting Windows from RAM, like a big programmable ROM chip!

—Edgar Reyes

You can get close with the DOS-based utility called RAMDRIVE that's included in Win95



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## Dual Soundcards

Is it possible to run two soundcards simultaneously in Windows? For example, a high-end card for digital recording and a Sound Blaster Live! for gaming?

—Matt Kearns

Windows makes using two soundcards difficult. First, you have to open the Multimedia control panel (in Windows 98) or the Sounds and Multimedia control panel (in Windows ME and Windows 2000) and select the "preferred device." This chooses the default soundcard, which remains active in all games and applications. To switch over to the second soundcard, you have to go back to the control panel; there's no way to assign all games to the Live! and all audio-editing apps to the high-end card.

However, some programs—games such as *Deus Ex* and music creation apps such as *Cubase* and *Cakewalk*—let you select audio cards through setup applets or preferences. The world's most popular soundcard, Creative Labs' Sound Blaster Live!, doesn't make things any easier by hogging IRQs (which can cause conflicts with other system devices).

Some users, particularly MIDI freaks who use their PCs to control digital audio production gear, find two soundcards a must-have configuration. While two Sound Blaster Live! cards is pretty much out of the question because of the above-noted potential for resource conflicts, a single Sound Blaster Live! driving software synthesizers and synchronizing off-board gear (such as samplers or drum machines) plays nicely with a high-

***"Some users, particularly MIDI freaks who use their PCs to control digital audio production gear, find two soundcards a must-have configuration."***

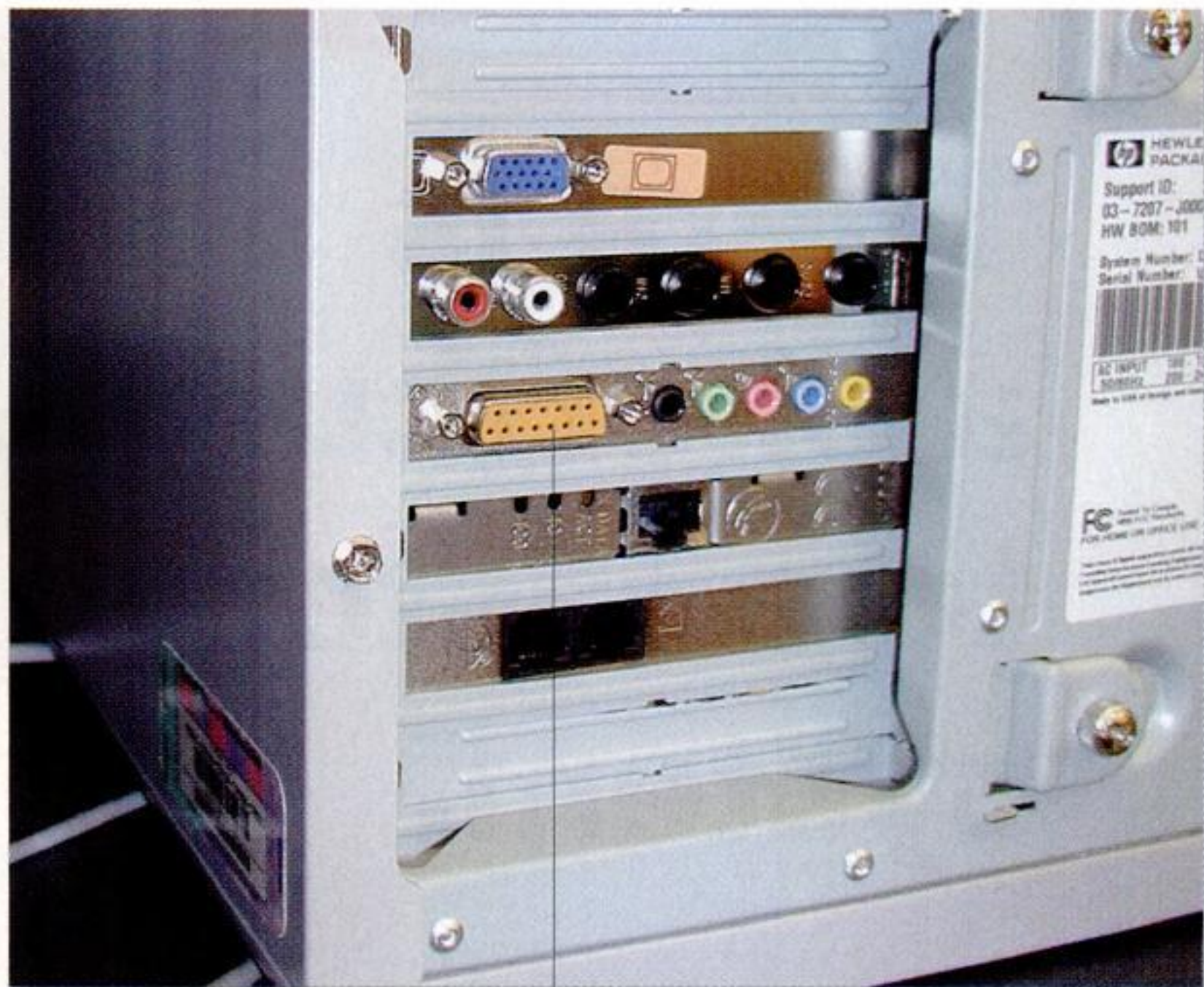
end, audio-only card used to mix audio streams and send signals to off-board processing gear.

## System Properties Revisited

In your April 01 issue, you described "Creating Your Own Start-Up Logo" with a transparent bitmap. I haven't figured out how to make a transparent bitmap, even though I have *Photoshop*. I had no problem creating a new file and using transparent background, but when I save it as a bitmap, that information is lost and the background turns white.

—Wayne

Your tip on creating your own start-up logo refers to a file called OEMINFO.INI in the C:\Windows\System directory. I don't have that file on my system. I've had Windows



**Best of both worlds:** Professional musicians can use the balanced connectors of this MIA Echo while still using their Sound Blaster Live! for MIDI in and out.

search for it, to no avail.

—Marcel Garneau

I tried your tip for creating my own start-up logo, and though I had no trouble putting my son's picture in the logo part, I cannot get the support information box you show at the bottom.

—Richard Hunter

I read the tip and did everything you said, but when I shut off my system and then restarted it, I still got the same screen at start-up. I do see the one I created in the System Properties screen, just like in the magazine, but can't get rid of the cheesy start-up logo I had before.

—James Ko

**Yikes!** The Doctor's tip about changing the logo and text in the System Properties dialog box was, shall we say, less than clear. Just before The Doctor wrote the article, one of those "California rolling blackouts" you keep hearing about had hit the office, so just for fun everyone in the office grabbed a fork for a game of Russian Roulette with one of the outlets. Guess whose turn it was when the power came back on?

Wayne: You're right, transparency information is not saved in a bitmap file. The Doctor suggested selecting the transparent background option so that *Photoshop* wouldn't fill in the background with its default white and rob you of the right to choose your own color. The transparency isn't

essential, however, and if you like, you can match the background color of your logo with that of the dialog box ... but The Doctor digresses.

**Marcel:** The file called OEMINFO.INI, if it does not already exist, needs to be created in Notepad and then saved with that name and placed in the C:\Windows\System directory. If it does exist and you want to replace it, don't forget to back it up so you can restore the original text later.

**Richard:** In order to get the "Support Information" button to appear, some text does need to appear in Line1 under [Support Information] in your OEM-INFO.INI file. Simply inserting quotation marks is not enough. Thanks to reader Noah Adams for pointing this out.

**And James:** Technically, the original tip should have described the procedure as "Creating Your Own System Properties Logo." Creating your own start-up logo is another procedure altogether—one The Doctor will share with you once the ringing in his ears stops.

## Media Player Aggravation

Is there a way to stop Windows Media Player from starting automatically when a music CD is loaded, short of removing Media Player from the system? If the option is in the menus, I can't find it.

—Harry Matthews

Go to Tools > Options, click the Formats tab, then uncheck CD Audio Track. While you're at it, check or uncheck any other media types for which you'd prefer to use alternate applications. ■

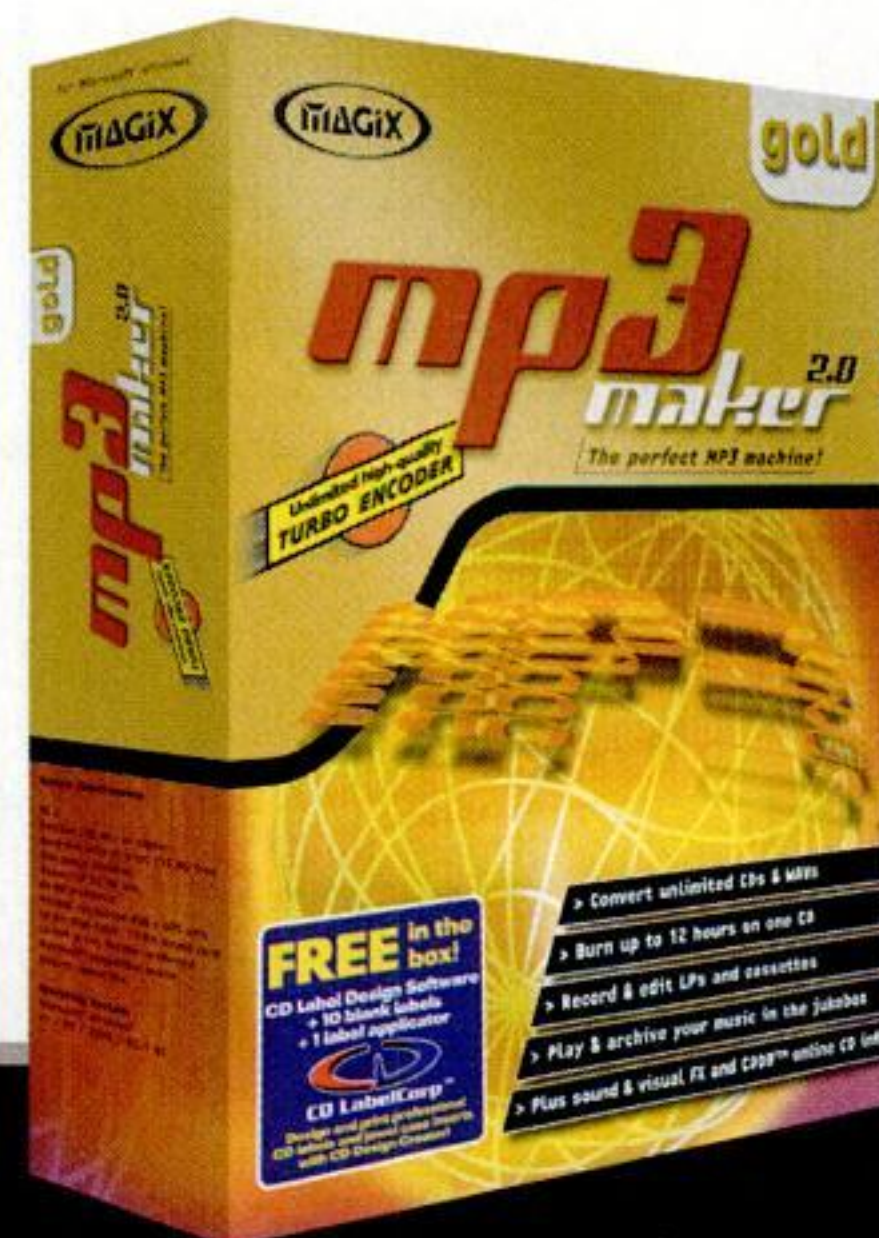


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# How To...

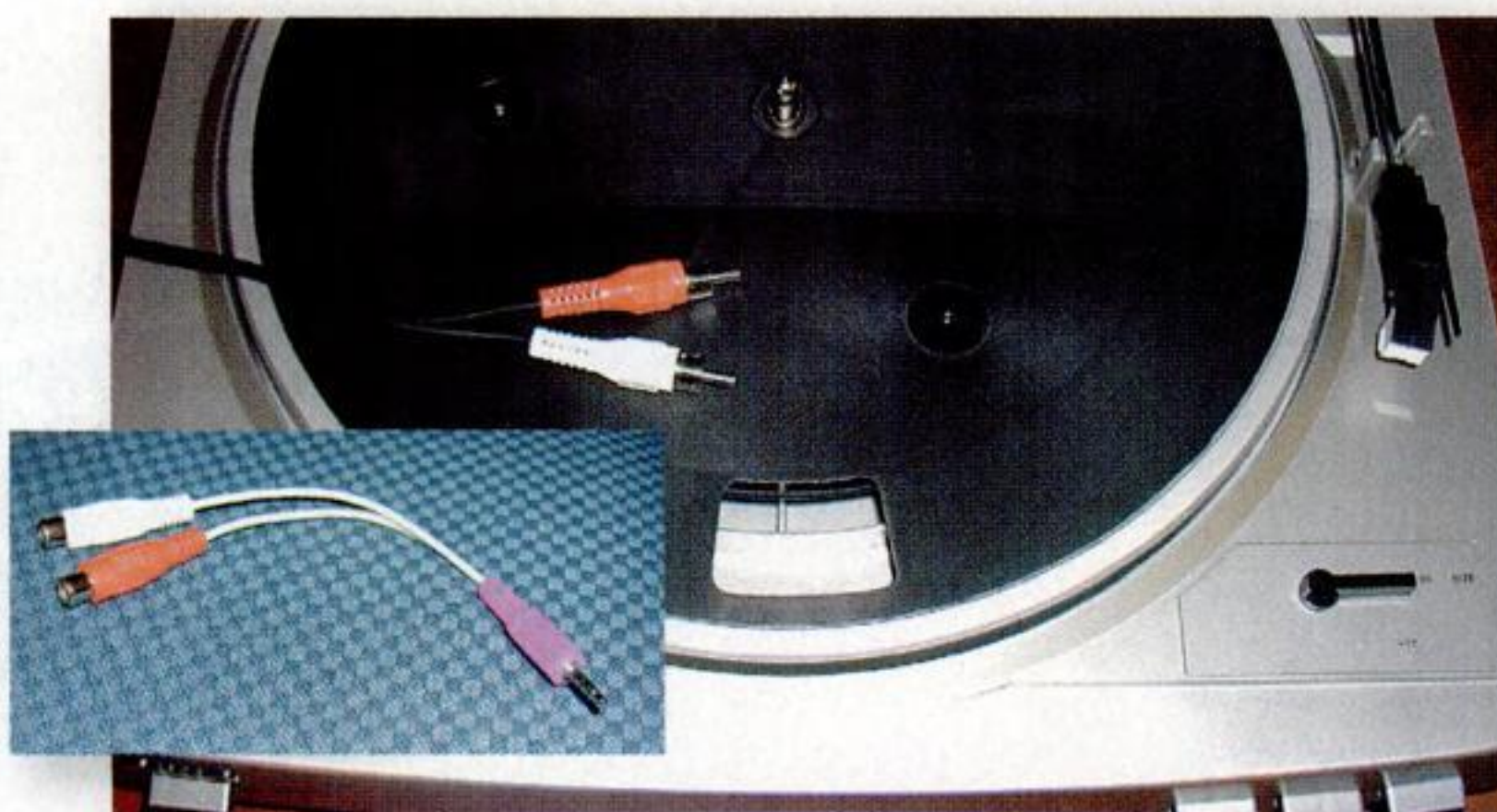
■ ■ ■ A step-by-step guide to tweaking your PC experience

**N**apster or no, if you've been on the MP3 bandwagon for any length of time, you've probably amassed quite a collection. But if you've ever tried to import them all into a software player or browse them on a portable, you know how frustrating a disorganized collection can be. Here are tips and tricks for organizing and cleaning up your collection, and for adding to it by ripping and encoding the songs you currently have living on vinyl.

—Kristen Salvatore

## Ripping from Vinyl

It's relatively simple to rig your own ripping station for converting records to WAV files and cleaning up pops and clicks. Converting the WAV files to MP3s is as simple as firing up *MusicMatch Jukebox* and choosing Convert from the File menu. But the whole process starts with a turntable.



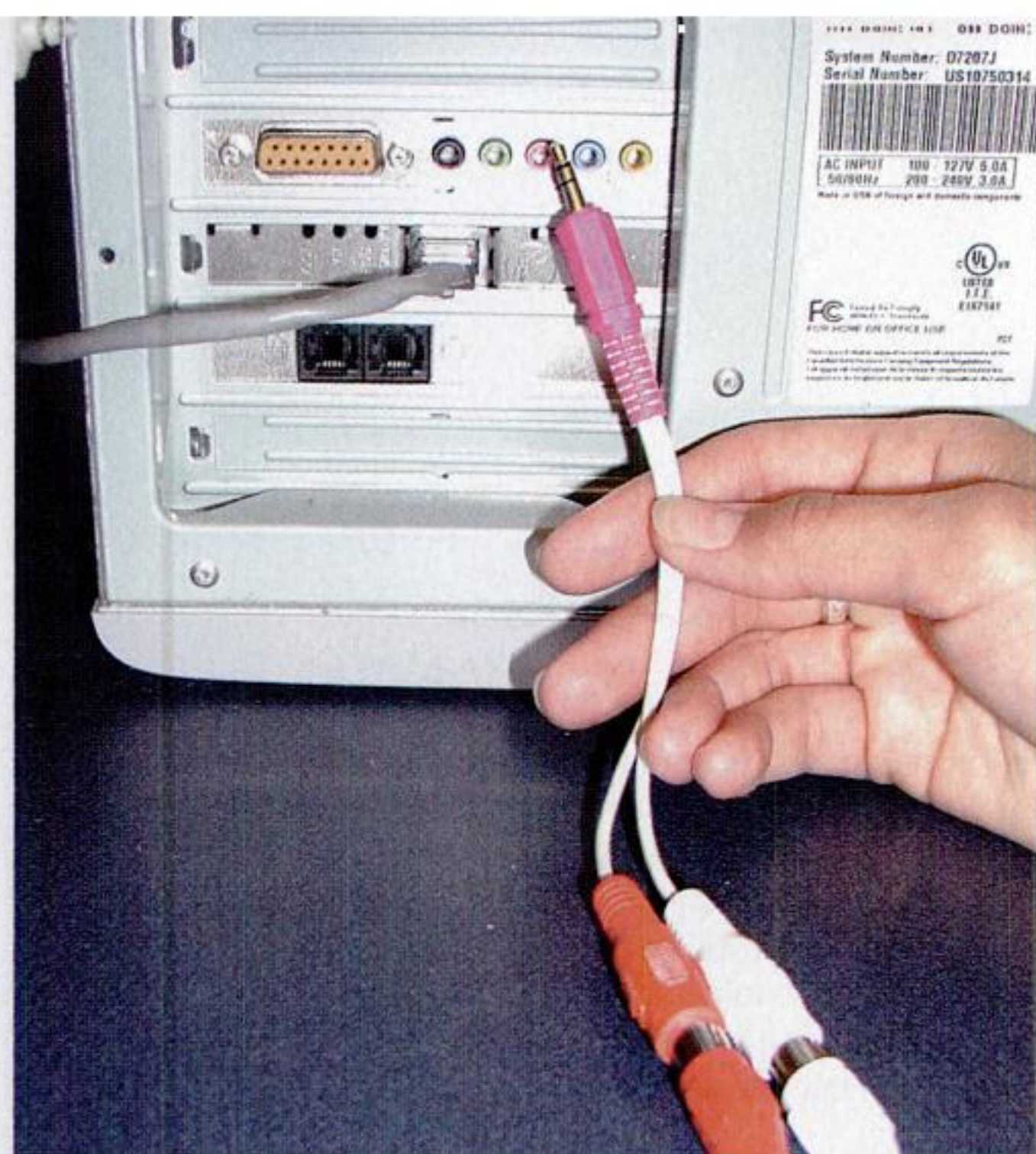
**1.** We picked up a turntable with stereo RCA outputs and a female RCA-to-3.5mm jack converter, a.k.a. a mini-to-twin converter with female RCA jacks. (The single jack should look like the jack on a set of small headphones.) If your turntable is already hooked up to a receiver, you'll need a mini-to-twin converter with male RCA jacks. In any case, you'll also need a PC equipped with a soundcard.

**2.** Our turntable wasn't especially expensive—\$135, with shipping, from J&R Music World ([www.jandr.com](http://www.jandr.com))—but it has two elements that made this project especially easy. One is its built-in stereo RCA outputs. The other is a built-in amplifier (its power button is pictured here), without which the output to the soundcard would be almost too quiet to hear. Running the turntable through a stereo receiver will also amplify the signal, or Radio Shack can equip you with a pre-amplifier for \$25.

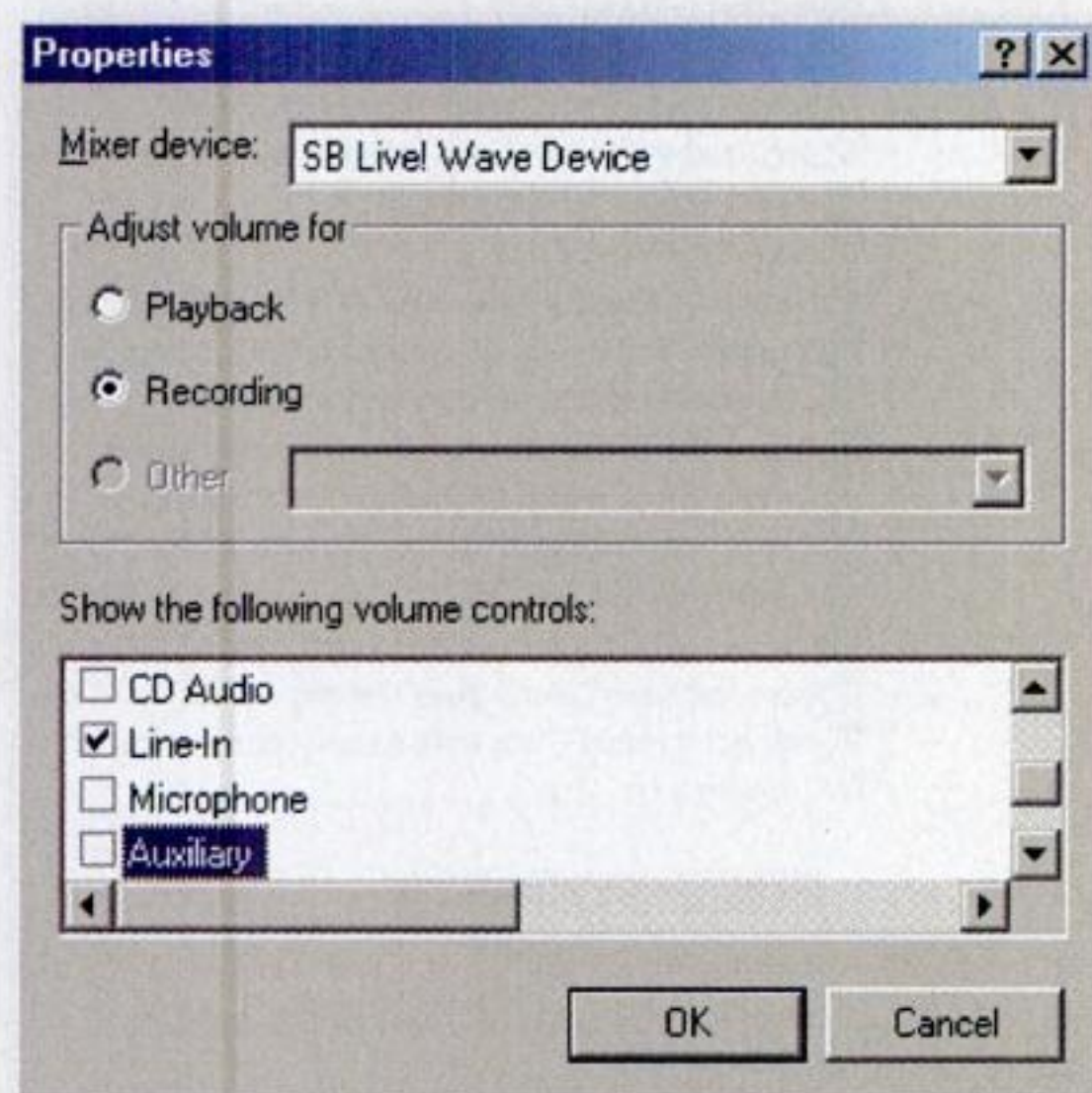


# Make the Most of Your



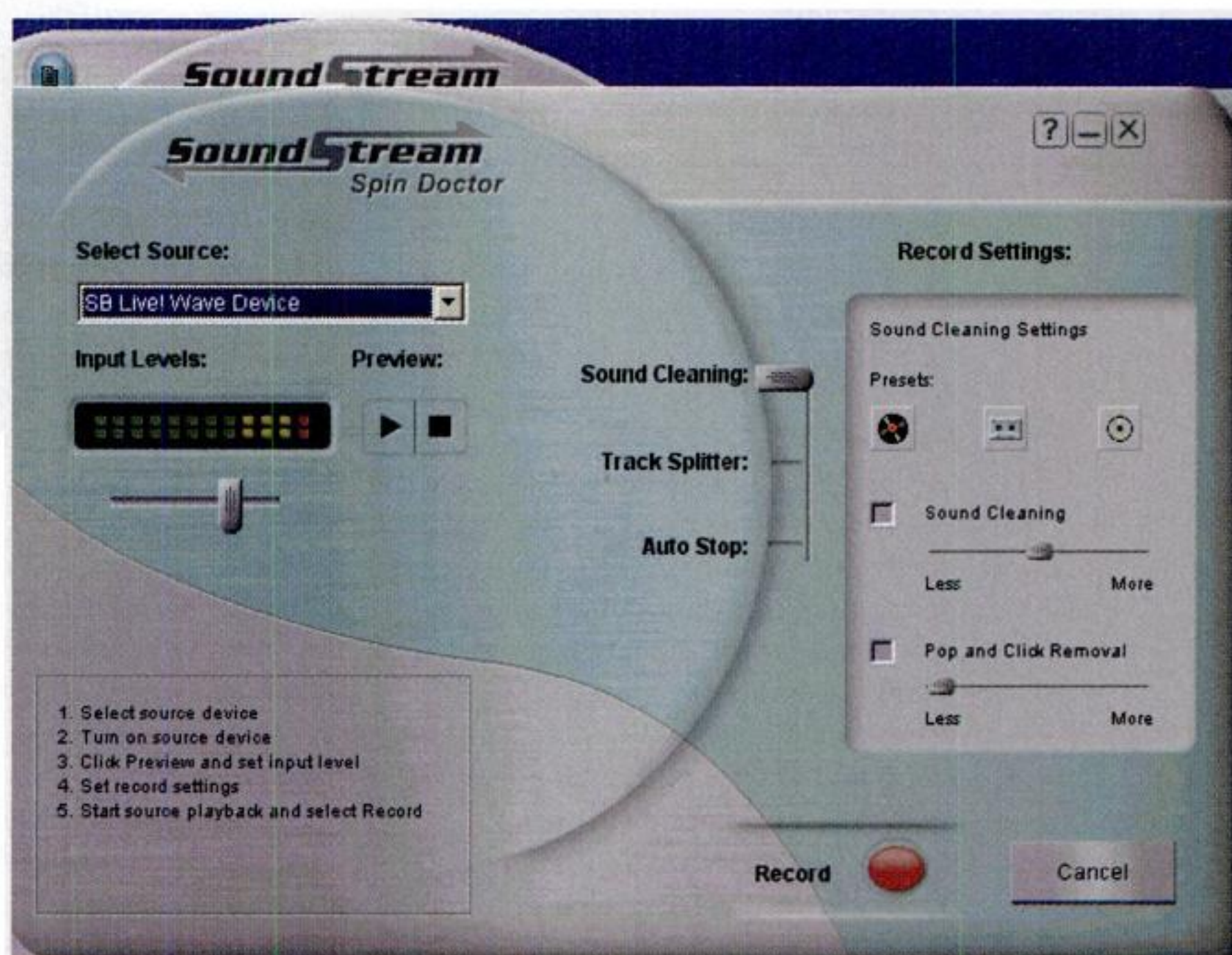


**3.** If, like us, you're using a turntable with a built-in amp, attach the female ends of the mini-to-twin converter to the turntable's RCA outputs. (If you're using a turntable without a built-in amp—that is, one that's hooked up to your stereo receiver—attach the male ends of the mini-to-twin converter to an output on the back of your receiver—any open output should work, but if there's one labeled "Rec-Out" or something similar, use it.) Attach the mini-to-twin's 3.5mm jack to the "Line-in" jack on your PC's soundcard.



**4.** Ensure your PC knows that you want it to capture sound through the soundcard's line-in jack by double-clicking the volume-control icon in the System Tray, choosing Options>Properties, clicking the Recording radio button, and ensuring that Line-In is selected.

**5.** Now fire up your recording software, drop the needle on the record, and hit Record. For software, we like the Sound Stream Spin Doctor utility built in to Roxio's *Easy CD Creator 5 Platinum*—it's incredibly easy to use—but the Sound Recorder program that comes with Windows (under Accessories in the Start menu) will also work. With *Easy CD Creator*, you can choose to have the program remove pops and clicks as it records, or simply to record your LP to a WAV file that you'll clean up yourself later, like we did. We're partial to *Clean 2.0*—another simple, straightforward program that makes it a cinch to remove pops and clicks, to boost bass, and to add brightness to recordings—but it'll set you back \$129.



# MP3 Collection

ADD TO IT,  
ORGANIZE IT,  
AND CLEAN IT UP.



# Organizing Your Collection

Standardizing your MP3 filing system makes it easier for you to immediately access a particular album or song, and eases the pain of importing your files into a software player or loading them onto a portable. Database-based software—such as *Real Jukebox* and *MusicMatch Jukebox*—doesn't really care how you've organized your files because it simply trolls your hard drive for any MP3 files and uses the files' ID3 tag information to organize the songs. But when you've got 8GB worth of music files on your hard drive, and all you really want to do is find Dean Martin's version of "Ain't That a Kick in the Head," as opposed to the rendition by Old Blue Eyes, you'll be a lot happier if there's at least some method to your file-storage madness. We recommend the following methods:



## BY ARTIST

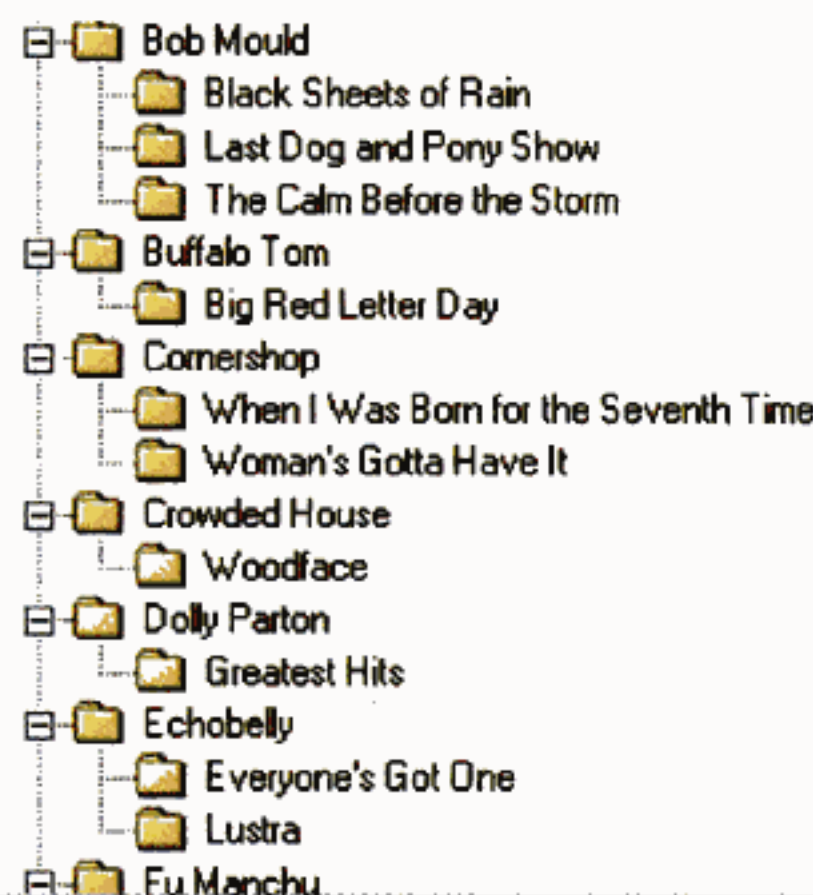
By far the most popular system is putting all of one artist's songs in a folder bearing his or her name.

### Pluses

- This is the only scheme that's feasible if you know only the name of the song and the artist who sang it. Ideally, you would get complete artist and album information from a file's ID3 tag, but those details are frequently missing from downloaded songs.
- With all the songs by an artist gathered together in a single folder, it's easy to use a renaming program to fill in common ID3 information in one fell swoop.

### Minuses

- It can be easy to forget which songs come from which albums.
- Now that you've organized your tunes by folder, you're out of luck with database-driven software that depends on ID3 tags for organization, unless your ID3 artist tags are consistent with the artist's folder name.



## BY ARTIST, THEN BY ALBUM

You'll need all the artist and album information at your fingertips, but if you have—or want—an especially good handle on your collection, this is the tidiest method.

### Pluses

- This is the only organization scheme that allows you to build a playlist of a single album if you're using a software player that doesn't act as a database (such as *Sonique* or *Winamp*) and thus doesn't pay attention to ID3 tags.
- Burning copies of individual CDs is a snap—just grab the folder of the specific album you want to burn, and drop it into your CD-burning software.
- If for some reason your ID3 tag information is lost, this scheme makes it easy to rebuild that information.

### Minuses

- Some software—such as the player-management programs included with every Creative MP3 product—won't search through subdirectories, so importing music means importing each directory, one at a time.
- Using this system requires a fairly serious commitment to constant filing.



## FREE-FOR-ALL

It requires very little in the way of organizational skills—just put all of your MP3 files into one big folder.

### Pluses

- This makes it easy to import files into players or software managers that don't drill down to read all the contents of a folder's subdirectories.
- If you're diligent about naming all files in a similar fashion, it's easy to scroll through alphabetically in search of a specific song.
- This is especially useful if you're acquiring most of your files by downloading them off the net—just set the software you're using to automatically dump downloaded files into a single folder.

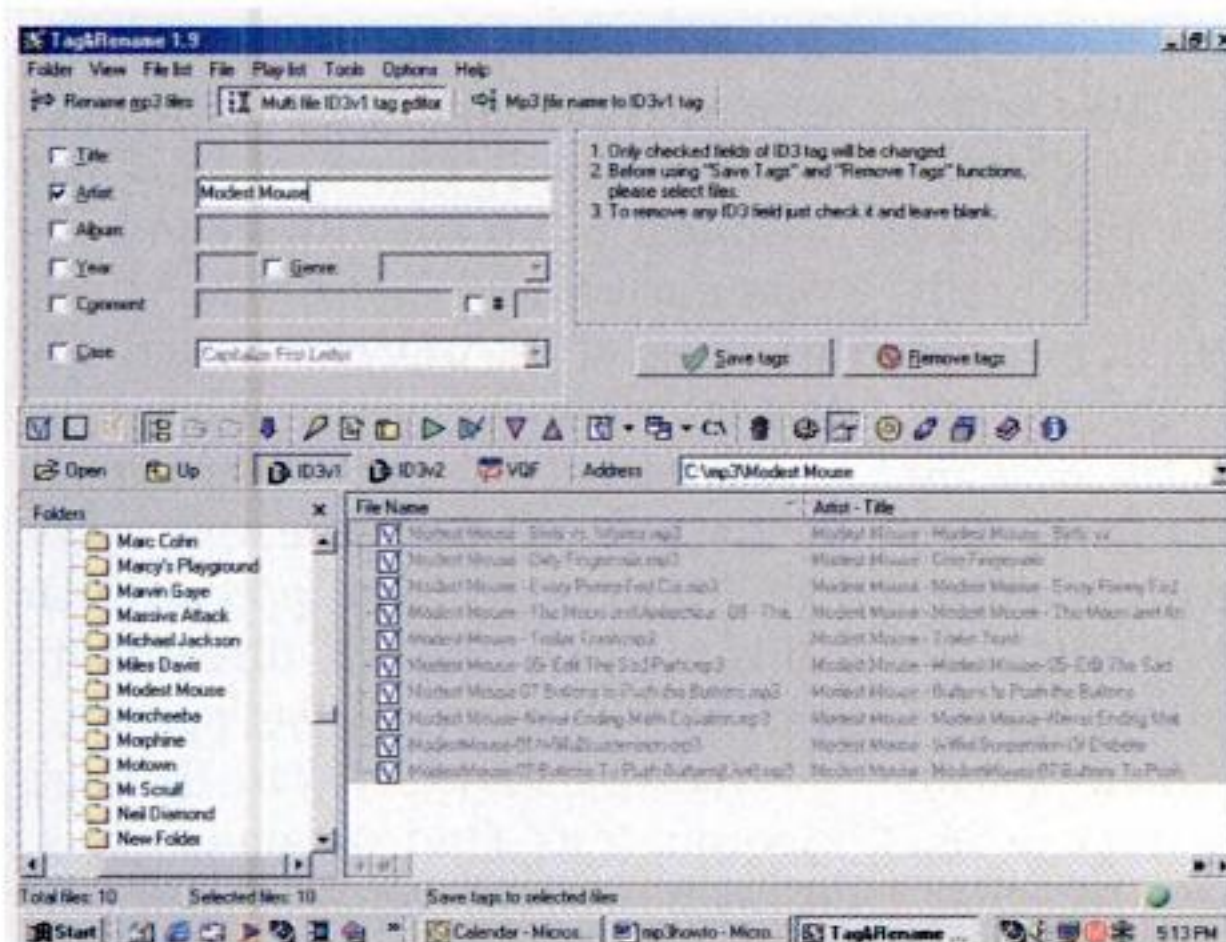
### Minuses

- If you're *not* diligent about naming all of your files in a similar fashion, this will yield a mish-mosh of MP3 files in a long list with no semblance of rhyme or reason, making it virtually impossible for you to quickly put your hands on a particular file.
- If you have several copies of the same song sung by the same artist, e.g., a studio version and a live version of the same tune, it's tough to distinguish them.

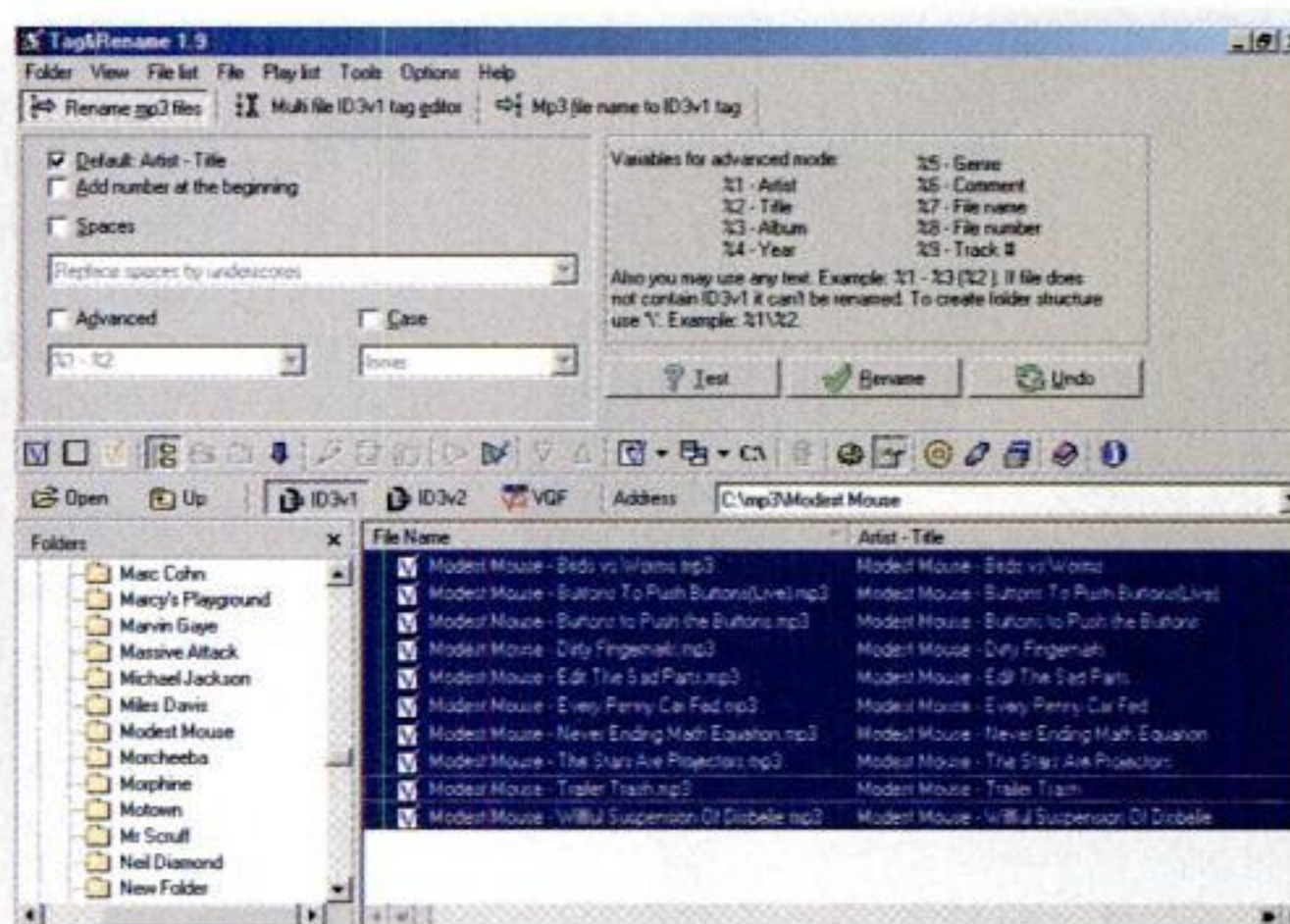


# Renaming Files & Updating ID3 Tags

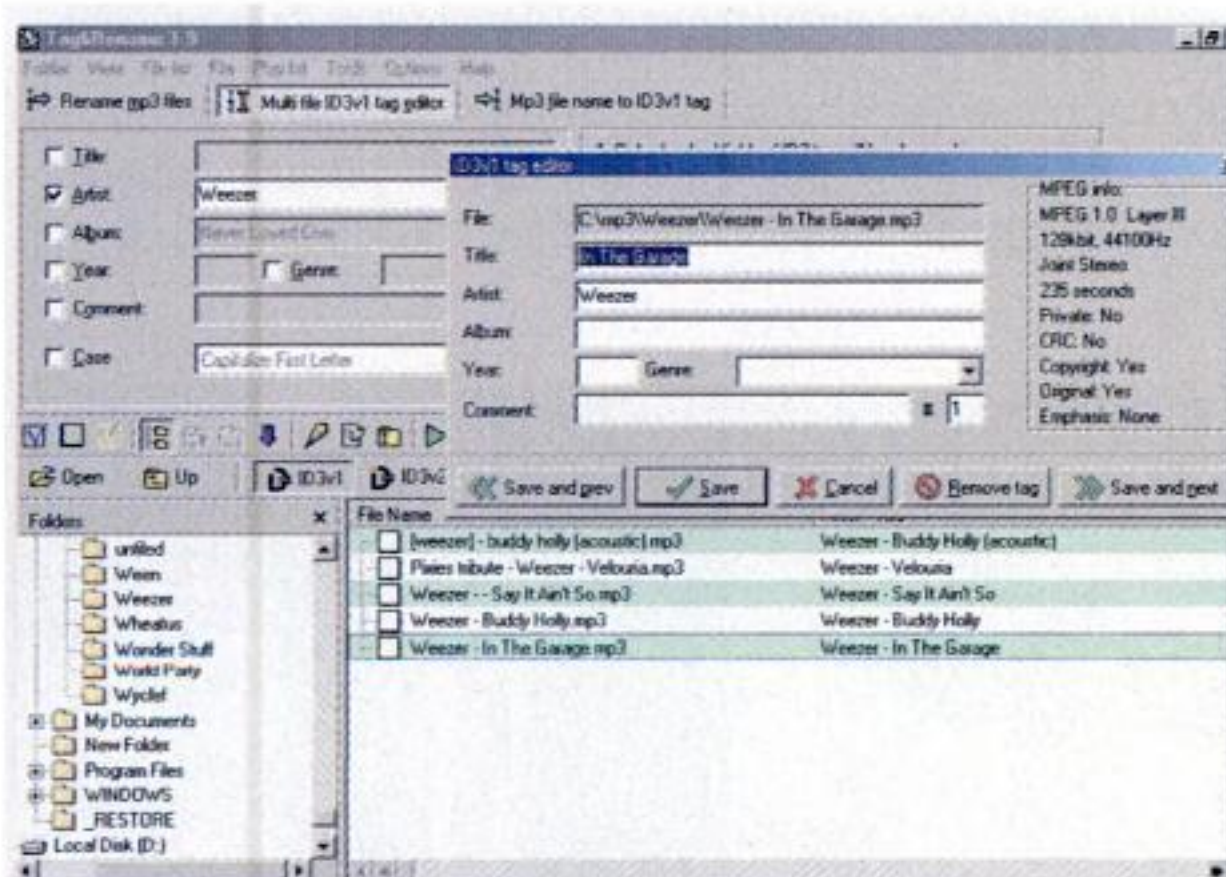
Unless you ripped all of your MP3s from CDs on a computer with CDDb access, chances are that most of your files are saddled with different naming schemes—and that very few have been graced with a complete set of ID3 tags. Why bother with the tags? Because almost all portable players and database-driven software players look to ID3 tags for direction on how to file MP3s. LCD readouts also require ID3 tags to display track information. We've checked out dozens of renaming and tagging apps—there are tons available for download from various sources, and many are available as shareware or freeware. Eventually, though, we settled on one that we think is worth the \$25 investment: *Tag & Rename* ([www.softpointer.com](http://www.softpointer.com)).



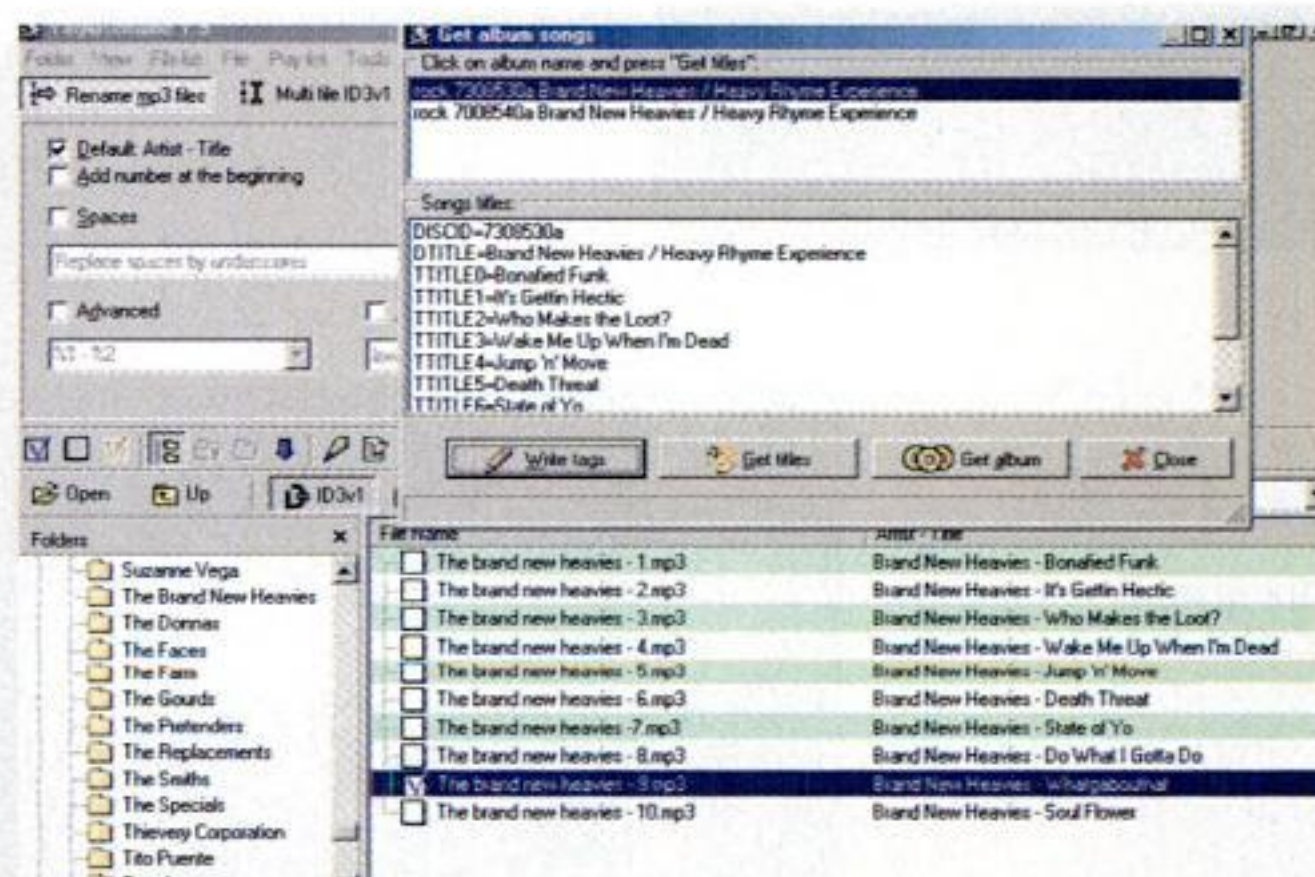
**1.** In our case, we had many files with correct artist and song information in the filenames but incomplete ID3 tags. We used *Tag & Rename*'s "Multifile ID3 tag editor" function to wipe out all the (mostly incorrect) information living in the old ID3 tags, then to fill in relevant information common to all the files in a single folder.



**2.** Once the files' ID3 tags were up to date, we used the "Rename MP3 files" function to standardize our file-naming scheme; the software does this by grabbing the information in each file's ID3 tag. In this case, we want all of our files to be named according to the scheme "Artist name - Song Title.mp3."



**3.** Unfortunately, even a top-notch renamer is going to require a fair amount of time and effort to put a helter-skelter collection in order. And in some cases, mass renaming or retagging isn't an option. *Tag & Rename* also allows you to individually edit each file's ID3 tag.



**4.** Why is *Tag & Rename* really our favorite? Because of its reverse CDDb function. If you have all of the files from one CD in order in the same folder but don't have the ID3—a common occurrence if you've been ripping files from CDs on a computer with no CDDb access—*Tag & Rename* will search CDDb for the CD information and fill in the tags for you. ■



# In the Lab

A behind-the-scenes look at Maximum PC testing



## Once Again, with Panache

We redefine style in the PC universe

**A**fter countless hours of trial and error, some last-minute worries whether BAPCo would release *SYSmark2001* in time, and no less than three phone calls disturbing an editor at home and flat on his back with the flu, we settled on the set of six desktop system benchmarks explained in detail at [www.maximumpc.com/benchmarking](http://www.maximumpc.com/benchmarking). Just in time, too. Some of us were getting hoarse from all the impassioned debate concerning what matters when reviewing PC hardware.

Early on, we agreed on a few basic points: features matter, performance matters, and size matters. And after lots of talk about what power users demand from their PCs, we also realized that style matters, too.

In our universe, however, "style" doesn't mean flashy colors or slick-looking but moronic user interfaces. It means attention to detail. PC style is derived from the elegant use of technology—efficient and sturdy

construction of hardware, and economical programming and interface design in applications. Style is also manifest when a hardware or software maker proves it has a real understanding of the way people actually use PC products.

*Maximum PC's* new high-tech page design also calls for more style in our reviews section. It's an approach that suits me just fine. My directive to writers doing reviews: Get personal. Put hardware and software through rigorous tests. Find out about everything a product *can* do—then take time to make sure that it does everything you *want* it to do. Even if a product has great extra features, there's no reason it should get high marks if it doesn't perform well in core functions.

The same should hold true for our reviews pages. We roll up our sleeves and get down and dirty when it comes to testing in the Lab. On the printed page, we'll strive to present immediately relevant results cleanly and clearly.

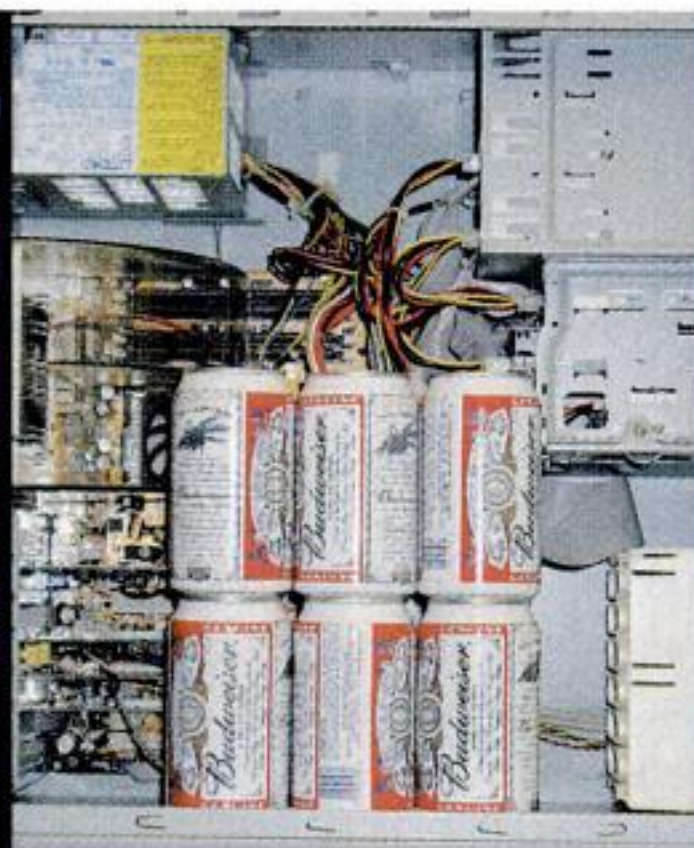
## A Machine of One's Own

Staffers get personal with the new zero-point systems

Like parents welcoming newborns, Gordon and Rob hefted six new test systems into the Lab and quickly got down to the business of bonding with their charges. Soon, others in the Lab joined in, and by deadline day, everyone had come to love the new Hewlett-Packard Pentium 4 systems as if they were members of the family.



Rob wanted his new test system to feel at home, so he outfitted it with some cozy accoutrements.



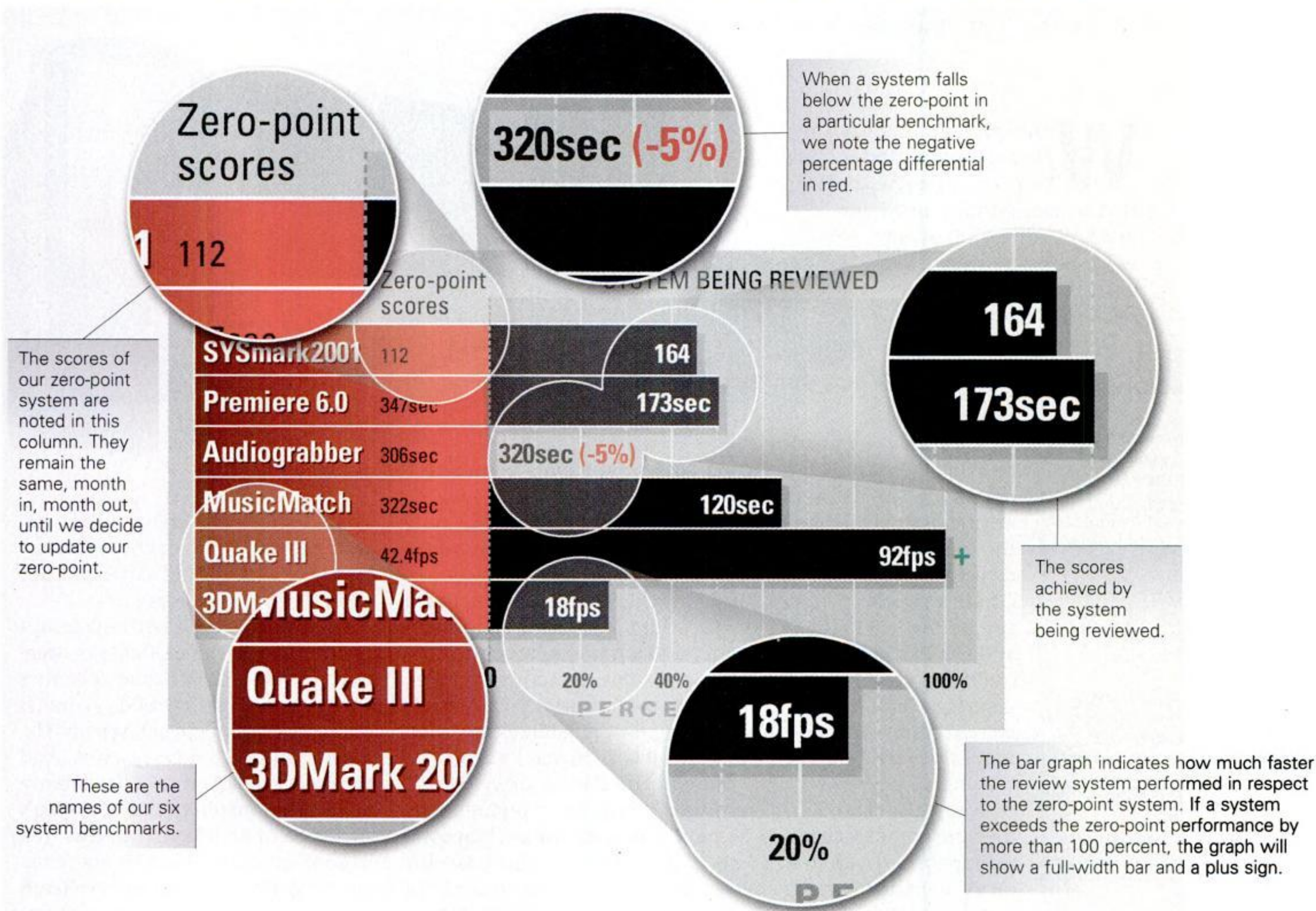
Gordon says he wanted to make sure that his test system stayed cool and comfortable.



Logan did say he was from "France."



# How to Read Our New Benchmark Charts



**T**he challenge: Develop a set of new benchmarks that gives today's fastest PCs a strenuous workout but restricts the tests to real-world applications. The answer: The new *Maximum PC* benchmarks.

The beauty of real-world benchmarks is that they gauge system performance in terms that everyone can relate to. After all, no PC enthusiast gets his or her jollies simply by running small loops of synthetic code—it's just not as fun as, say, playing *Quake III*. And unlike many synthetic benchmarks, real-world benchmarks can test multiple components and how they react to one another in one fell swoop.

So which tests did we finally land on? Well, we updated *SYSmark* (a suite of 14 individual application benchmarks) to the 2001 version. We also dumped our old *Photoshoptest* for a home-grown *Premiere DV* editing test that taps into CPU, memory, and hard-drive performance. *Audiograbber* and *MusicMatch*

*Jukebox* now test CD audio extraction and MP3 encoding, respectively. And to gauge a system's gaming prowess, we made our own *Quake III* demo (to test OpenGL performance), and tapped the Nature demo in *3DMark 2001* to test DirectX 8 performance.

For more information about all of these desktop system benchmarks, as well as details on how we test individual system components, go to [www.maximumpc.com/benchmarking](http://www.maximumpc.com/benchmarking). At this URL, you'll also find information on our notebook benchmarks (which differ from our desktop tests), as well as files and links to help you run the exact same benchmarks on your computers at home!

OK, here's how to read our new benchmark chart. The benchmark scores of all systems being reviewed are compared to *Maximum PC*'s own "zero-point" desktop and notebook systems (the desktop system is also used as a test bed for individual component testing).

The zero-point desktop system is an

HP Pavilion that includes a 1.3GHz Pentium 4 processor, 256MB of PC600 Rambus Direct RDRAM, a 60GB DiamondMax Plus 60 hard drive, and an Asus V7700 GeForce2 Pro 64MB videocard. Notice that this system does *not* include a DirectX 8-compatible videocard. So, to divine a score for DirectX 8 performance for our benchmarking chart, we swapped in a GeForce3 reference design videocard. Note that this faster, next-gen card is *only* used for our DirectX 8 *3DMark 2001* benchmark.

The zero-point notebook is a Micron Transport GX+ that includes an 850/700 Pentium III SpeedStep CPU (tested at 850MHz), 128MB SDRAM, a 16MB S3 Savage IX video chipset, a 4200rpm IBM Travelstar hard drive, and a 24x Toshiba CD-ROM drive.



Go to <http://www.maximumpc.com/benchmarking> for full details on our benchmarking policy!



# Compaq Presario 7000

Do-it-yourself DVD, for the first time ever in an OEM system

**W**ithin an hour of unpacking, piecing together, and booting the new Compaq Presario 7000, we had successfully burned our first DVD. This kind of out-of-the-box experience is like getting exactly what we wanted for Christmas.

The Presario 7000 is the

first system we have received that includes Pioneer's groundbreaking DVD-R/CD-RW drive, essentially the same drive that Apple dubbed the "SuperDrive" and dropped into its latest G4s. In addition to supporting CD-R and CD-RW, this bad boy is capable of writing 4.7GB DVDs that can be played on most stand-alone DVD players.

Using a FireWire port conveniently placed on the front of the machine, we imported footage shot on a Canon digital video camera directly into *Studio DV*, a sophisticated and surprisingly easy-to-use video-editing app that's bundled with the system. The capture process was not only painless, but *Studio DV* also accurately detected scene changes in our raw footage, which made editing a snap. Despite the clunky interface of the DVD-mastering

## DVD authoring finally comes to the desktop.

software, *DVDit LE*, it took us only minutes to drop in backgrounds from the saccharin collection of stock photography included with the program, add a menu and a few chapter buttons to the screen, and assign video clips to the buttons. The result? A touching, evocative film-poem in less time than it takes to make a casserole.

Though the DVD-R drive (which records DVDs at 2x) is undoubtedly the most appetizing feature, you don't have to be an auteur to appreciate the Presario 7000. Compaq stacked our test machine with a 1.33GHz Athlon and 256MB of DDR SDRAM, which blazed through the brutal *SYSMARK 2001* benchmarks. Gamers won't be disappointed by the Klipsch ProMedia 4.1 speakers and GeForce2 Ultra-based videocard, which cranked out a buttery-smooth 50fps in our *Quake III* tests. Compaq also threw in a 48x CD-ROM drive, a thoughtful touch given that most drives that do double-duty as DVD players and CD-RW burners are notoriously pokey when performing mundane tasks such as CD-ripping.

The case's translucent plastic faceplate is a study in smart design. One FireWire port and two USB ports are accessible through a small door in the front of the case. Below that, the faceplate pops open for storing frequently used CDs and DVDs. Pop off the top half of the faceplate, and Compaq's unique drive rails make swapping out drives a snap. The software bundle is slim but intelligently selected, choosing, for instance, a full version of Microsoft *Word* rather than the wimpy Microsoft

*Works* bundle. The digital video software provides loads of cheerful functionality that should satisfy all but dedicated video editors.

The Presario isn't without disappointments. Two lone DIMM slots were filled with two 128MB modules rather than a single 256MB DIMM—so much for a cost-efficient upgrading path. The power supply is a miserly 250W. And the one-year parts and labor warranty is less than inspirational. Compaq's inclusion of an Ethernet card as well as a 56K modem leaves only one of the six PCI slots available. A GeForce3 card in a machine this loaded would have pushed our rating to a Perfect 10.

Considering that Pioneer intends to introduce a version of its DVD-R drive to consumers this spring at a list price of \$995, we consider Compaq's bundling of the DVD-R to be—dare we say it?—practically a freebie at this relatively modest price. The Presario 7000's combination of brute strength, stylish presentation, and loads of top-of-the-line features would be a great package even without the DVD-R drive. But the addition of this cutting-edge technology and an exhilarating out-of-the-box experience elevates this system to Kick Ass status.

—LOGAN DECKER



## UNDER THE HOOD

### THE BRAINS

|           |                                                                                                  |
|-----------|--------------------------------------------------------------------------------------------------|
| CPU       | AMD Athlon 1.33GHz                                                                               |
| RAM       | Two 128MB PC800 DDR SDRAM DIMMs                                                                  |
| I/O ports | Four USB, three FireWire, one serial, one parallel, one game port, PS/2 keyboard and mouse ports |

### DISPLAY

|                 |                                                   |
|-----------------|---------------------------------------------------|
| Videocard       | 64MB Creative 3D Blaster Annihilator II Ultra DDR |
| Display         | 19-in. Compaq MV monitor                          |
| Refresh@max res | 60Hz@1600x1200                                    |

### STORAGE

|            |                            |
|------------|----------------------------|
| Hard drive | 75GB IBM Deskstar, 7200rpm |
| DVD-ROM    | 2x Pioneer DVD-R 103       |
| CD-ROM     | 48x CD-ROM                 |

### NETWORKING

|       |                          |
|-------|--------------------------|
| LAN   | 10/100 Mbps Ethernet     |
| Modem | Generic 56K PCI faxmodem |

### SOUND

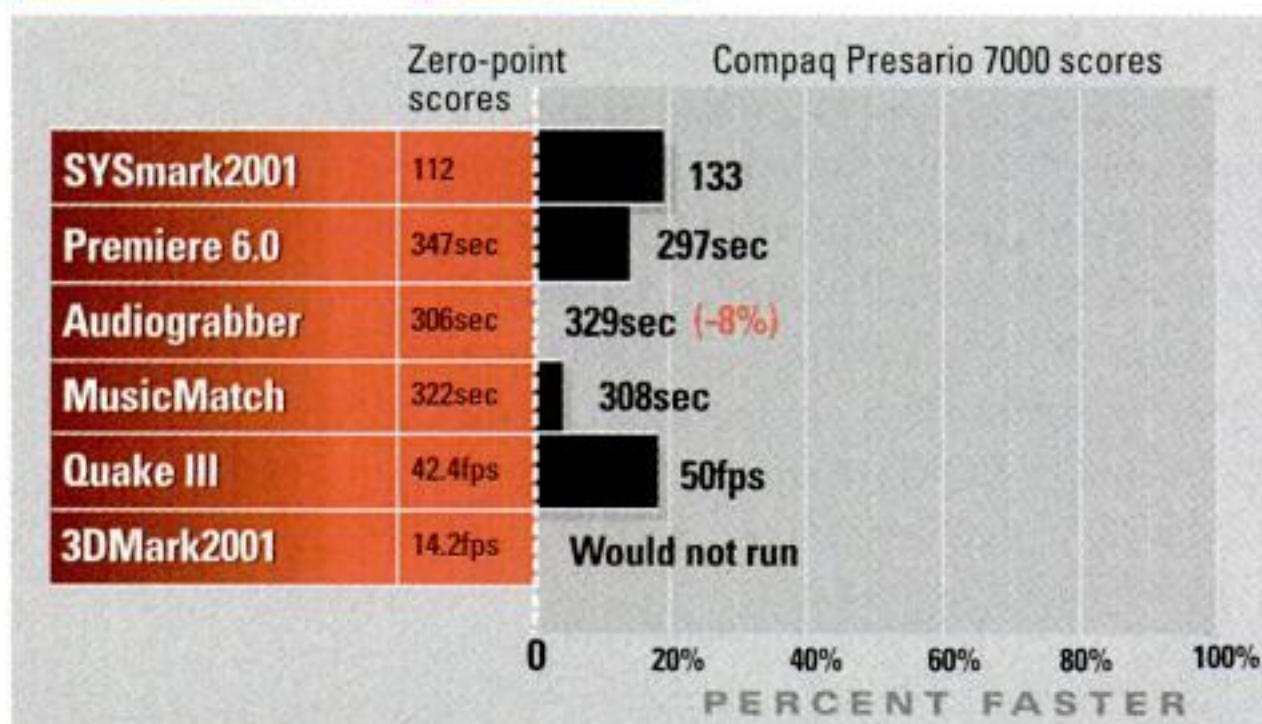
|           |                                         |
|-----------|-----------------------------------------|
| SOUNDCARD | Creative Labs Sound Blaster Live! Value |
| SPEAKERS  | Klipsch ProMedia 4.1 Surround           |

### THE BUNDLE

Windows ME, *Studio DV*, *DVDit! LE*, Microsoft *Word*, Microsoft *Money*, Adaptec *Easy CD Creator*, Adaptec *DirectCD*, WinDVD, McAfee *VirusScan*, Quicken *TurboTax*, Tutorial CD, *Recovery CD*, *QuickRestore CD*

BOOT: 40 sec.

DOWN: 7 sec.



Full benchmarking details at [www.maximumpc.com/benchmarking/index.html](http://www.maximumpc.com/benchmarking/index.html)

## MAXIMUMPC VERDICT

Presario 7000  
COMPAQ

### + WHAT WE LIKE

Compaq is first out of the gate with the Pioneer DVD-R/CD-RW—in a feature-packed, accessible design.

### - WHAT WE HATE

With a measly 250W power supply, only one free PCI slot, and both RAM slots filled, Compaq didn't leave much room for expansion.

PHONE 800.888.0220  
www.compaq.com

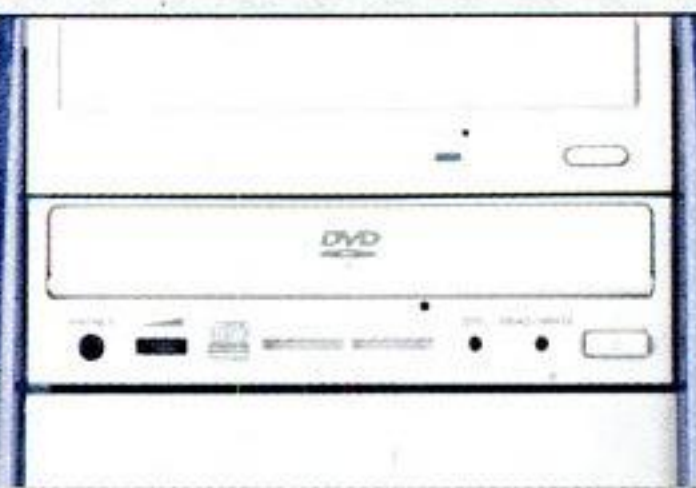
\$3,155<sup>00</sup>  
(\$2,656 w/o monitor)

9

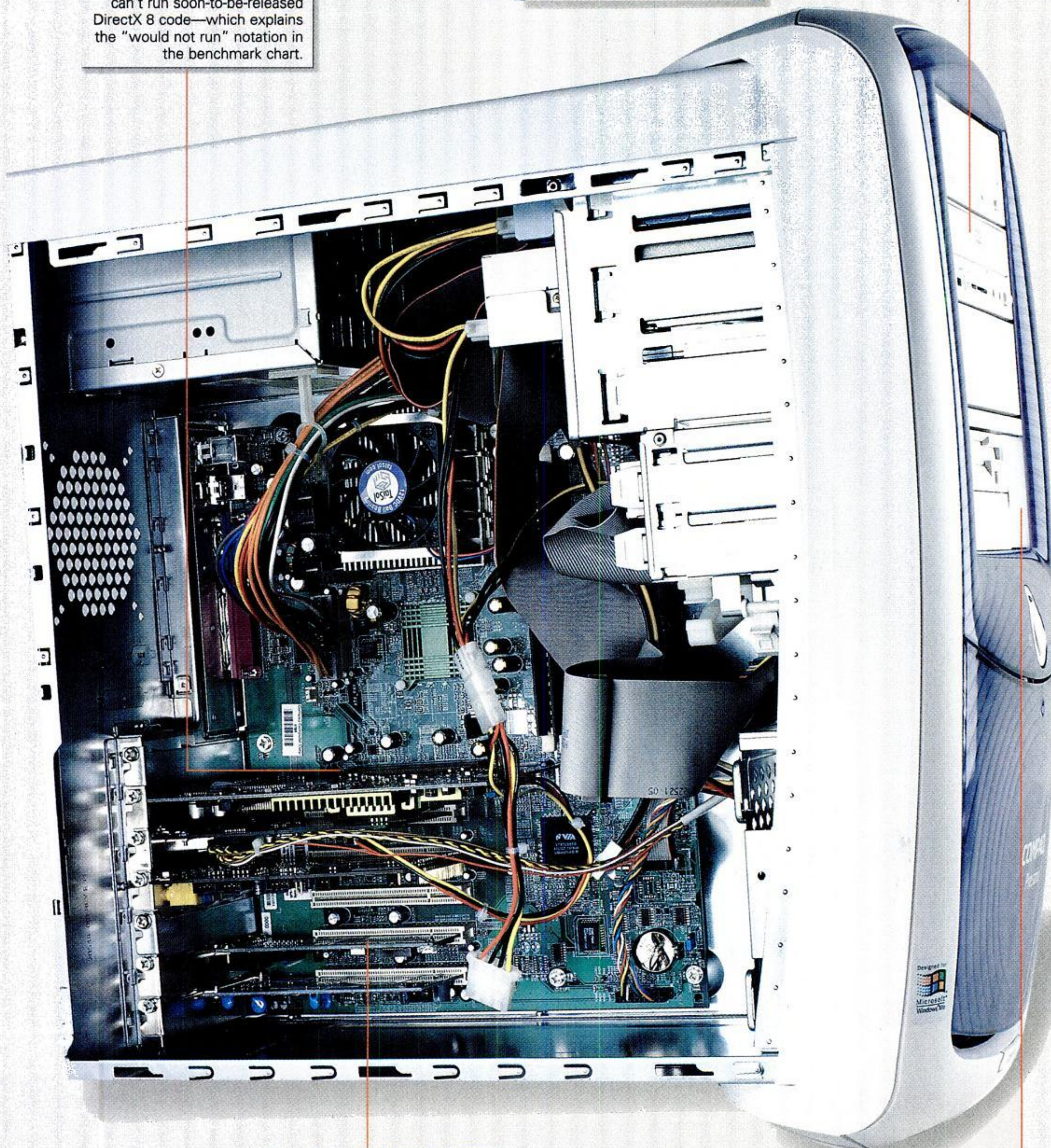


#### Trade up to DVD-R:

The DVDs we burned with the Pioneer drive played in every DVD drive we put them in—even a crusty, first-gen RCA DiVx player!



**No DirectX 8 for you!** The GeForce2 card stuffed in this slot is damn fast in today's games, but can't run soon-to-be-released DirectX 8 code—which explains the "would not run" notation in the benchmark chart.



#### Vacancy control:

We love all the extras, such as the Sound Blaster Live! and Ethernet cards, but there's not much room for growth.



**Plug and play:** In the "why-doesn't-everyone-do-this" category, the Presario offers FireWire and USB ports up front behind a sliding door on the front of the case.





# Dell Inspiron i8000

Drive away in the Dodge Viper of notebooks

**H**ow do you improve upon a Perfect 10 notebook? For Dell, beating the Kick Ass Inspiron i8000 (reviewed in December 2000) was easy. The company just dropped in the fastest mobile processor in history and upgraded to the fastest mobile 3D graphics you can find. With Intel's new 1GHz SpeedStep Pentium III processor and nVidia's GeForce2 Go graphics chipset, this is a notebook that doesn't make any

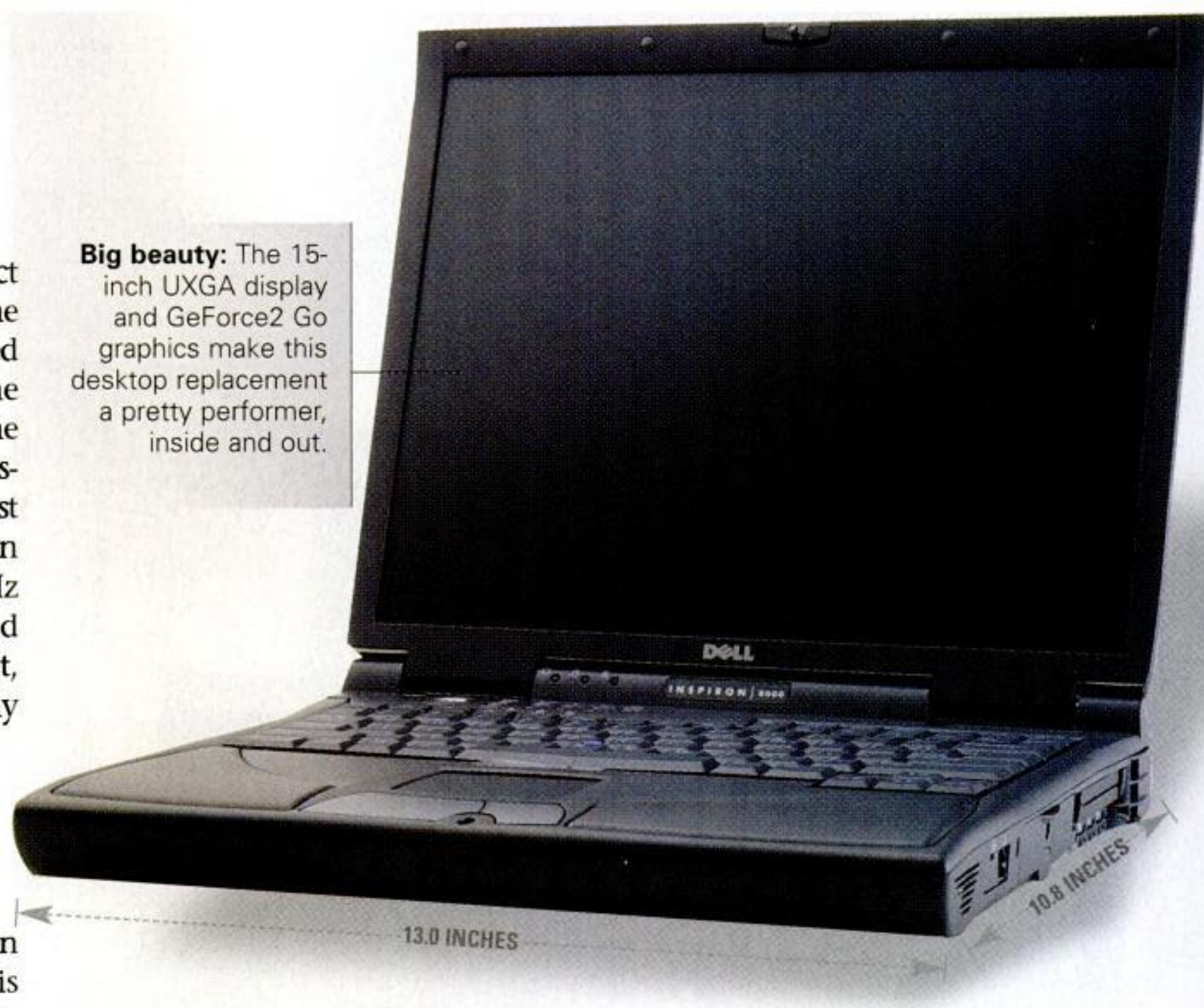


excuses to gamers.

At the heart of the new Inspiron is Intel's 1GHz SpeedStep CPU. AMD may have beaten Intel to the 1GHz mark on the desktop, but Intel is still out in front in the notebook arena's processor race. This SpeedStep runs at a full 1GHz when plugged into steady AC. Pull the plug, though, and it clocks down to 700MHz. Wonder why Intel doesn't step down the CPU to slower speeds to save more juice? Intel says that, in its tests, the company has hit a wall of diminishing returns at 700MHz. Lower the speed, and you don't see any additional power savings.

Breaking the mobile 1GHz barrier warrants a standing ovation, but even more of a showstopper is nVidia's GeForce2 Go. Essentially a mobile version of the GeForce2 MX, the GeForce2 Go is a major

**Big beauty:** The 15-inch UXGA display and GeForce2 Go graphics make this desktop replacement a pretty performer, inside and out.



## UNDER THE HOOD

### THE BRAINS

|                  |                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CPU</b>       | Intel Mobile Pentium III SpeedStep<br>1GHz/700MHz                                                                                                                           |
| <b>RAM</b>       | 128MB PC100 SDRAM                                                                                                                                                           |
| <b>I/O ports</b> | Dual Cardbus PC Card slots, VGA, composite video-out, parallel, serial, two USB 1.0 ports, PS/2 keyboard and mouse ports, mic-in, line-in, headphone, IrDA, docking station |
| <b>Modem</b>     | Lucent V.90 in miniPCI slot                                                                                                                                                 |
| <b>LAN</b>       | 10/100 Fast Ethernet                                                                                                                                                        |

### DISPLAY

|                  |                              |
|------------------|------------------------------|
| <b>Videochip</b> | nVidia GeForce2 Go with 32MB |
| <b>Display</b>   | 15-in. UXGA                  |
| <b>Max res</b>   | 1600x1200                    |

### STORAGE

|                   |                             |
|-------------------|-----------------------------|
| <b>Hard drive</b> | IBM Travelstar 32GB         |
| <b>DVD-ROM</b>    | Toshiba 8x DVD-ROM SD-C2402 |

### SOUND

|                   |               |
|-------------------|---------------|
| <b>Audio chip</b> | ESS Maestro 3 |
|-------------------|---------------|

### WEIGHT

|                     |         |
|---------------------|---------|
| <b>Lap weight</b>   | 8.2 lbs |
| <b>Carry weight</b> | 8.9 lbs |

**BOOT: 49 sec.**

**DOWN: 18 sec.**

breakthrough in notebook graphics. With this 3D chipset, the i8000 delivers *Quake III Arena* at 1024x768 resolution with high-quality graphics. The GeForce2 Go isn't all about gaming, however. Mobile power users will also applaud the multi-monitor feature. Like the TwinView version of the GeForce2 MX, the GeForce2 Go lets you add a second monitor as a second desktop (most notebooks simply display the same desktop on both their built-in and external displays).

If you don't like the touch pad, the Inspiron lets you switch to the eraser-nub. Internally, the Inspiron sports Intel's mobile 815 chipset, which offers full 4x AGP support.

The i8000's other amenities uphold the high standards we've seen in previous Inspiron notebooks. The 15-inch TFT display is fairly bright, razor-sharp at 1600x1200, and good for off-axis viewing. Our i8000 came stock with a Toshiba 8x DVD-ROM drive, a floppy drive in one of the expansion bays, and a lithium ion battery in the second expansion bay. Optional equipment includes a \$250 CD-RW drive that'll let you burn direct disc-to-disc copies on the road, and a second battery for extended run time. We expected Dell to ship us the i8000 with a DVD-ROM/CD-RW combo drive—but that wasn't available at press time. Drat!

Battery life on this monster is also good considering the amount of power going to the large LCD panel. We were able to

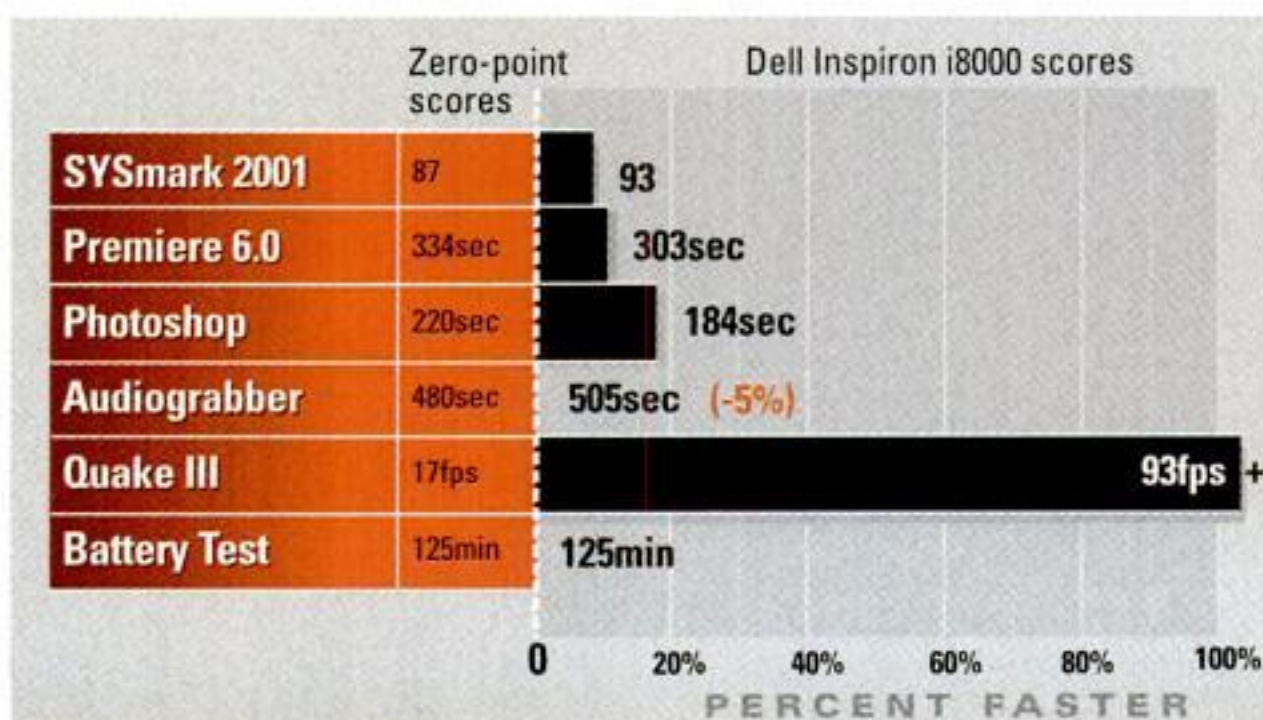
watch a little over two hours of *JFK* (the director's cut) before the battery went out. If you ditch the floppy drive for a second battery, we're pretty sure even Oliver Stone's most paranoid three-hour film would be no match for the i8000.

Connectivity features includes an infrared port, FireWire, and a V.90 modem and 10/100 Ethernet miniPCI combo card. A 32GB IBM Travelstar drive rounds out the i8000's hardware combination.

We have seen comparisons between the i8000 and Apple's new Titanium G4 Powerbook, but we think they're unfair. The i8000 is a desktop replacement and the G4 is a conversation piece. The i8000 offers far more bay options and usable peripherals, twice the processor speed, a true 3D accelerator, and a higher-resolution screen. We would gladly take power and versatility over the Apple's unusual shape any day.

For nearly \$600 less than the Micron GX+ we reviewed in March, the i8000 is a no-brainer for true power users. We almost dinged the Dell for leaving out a combo drive, but props are in order for the first machine to deliver 1GHz along with the first truly powerful mobile 3D chipset.

—GORDON MAHUNG



Full benchmarking details at [www.maximumpc.com/benchmarking/index.html](http://www.maximumpc.com/benchmarking/index.html)

## MAXIMUMPC VERDICT

Inspiron i8000  
DELL

### + WHAT WE LIKE

Go-go graphics and a blazing-fast 1GHz P-III makes playing *Quake III* almost like dragging on a desktop.

### - WHAT WE HATE

The notebook packs enough poundage to send a ditched commercial airliner straight to the bottom of the ocean.

PHONE 800.915.3355  
www.dell.com

\$2,971.00

10



# WinBook X1

An all-aluminum rocket blasts to 1GHz

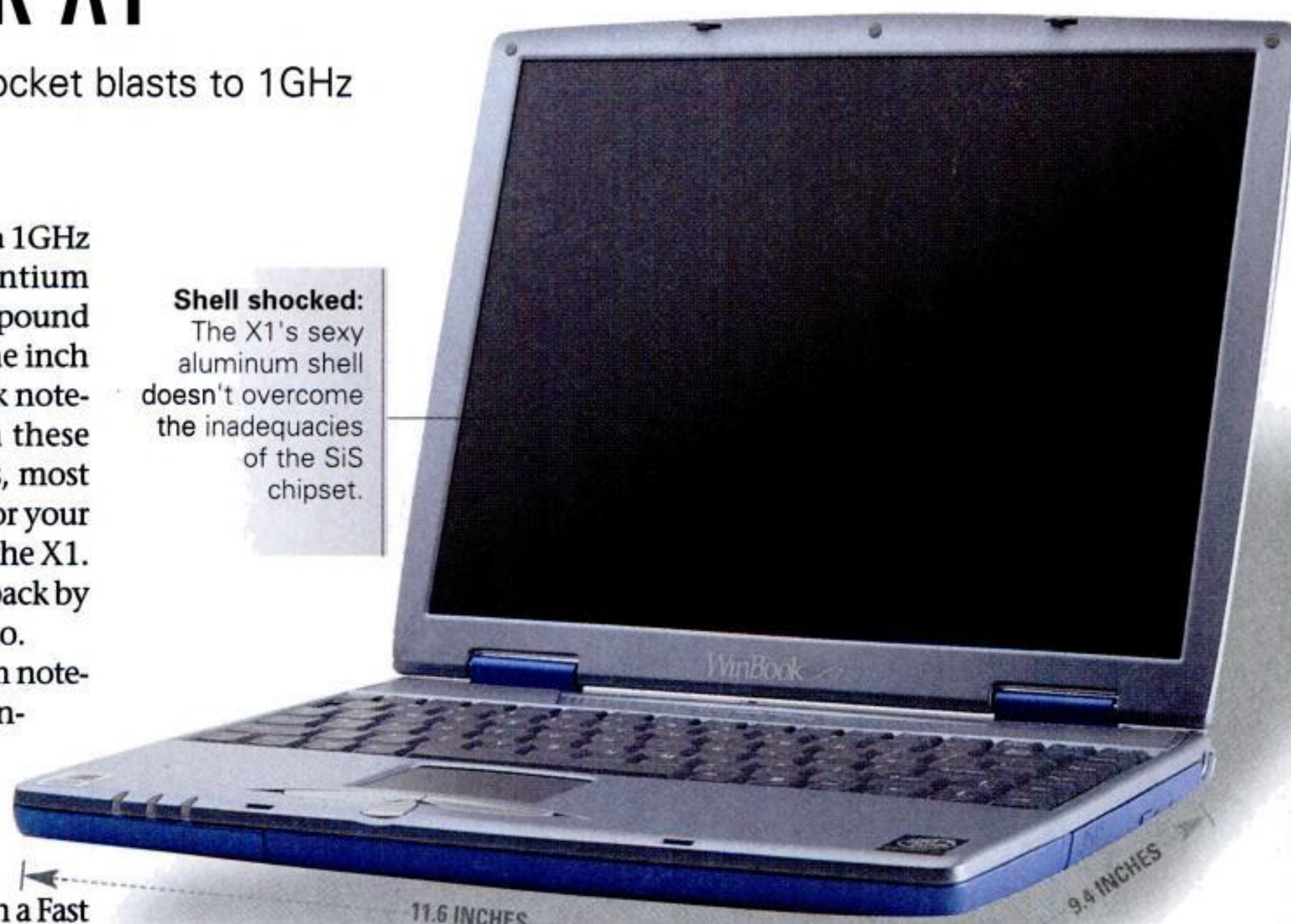
**W**inBook packs a 1GHz SpeedStep Pentium III into a five-pound notebook that's just one inch thick. While inch-thick notebooks are as common these days as Toyota Camrys, most offer just a hard drive for your storage needs. But not the X1. It pulls away from the pack by offering DVD-ROM, too.

And unlike many slim notebooks, the X1 also manages to wedge in a slew of ports that many of us couldn't do without. We're talking parallel, serial, two USB, and even a Fast Ethernet port. These port options, along with the built-in DVD-ROM drive, make the X1 even more mobile than some smaller notebooks because it doesn't need a port replicator or a cumbersome external optical drive.

Amenities trail off in the graphics department, however. WinBook saved space in the X1 by building the system around SiS's integrated chipset. Besides the normal functions performed by all motherboard chipsets, the SiS also handles 2D and 3D graphics rendering and recruits a portion of main system memory for graphics duties. (Our X1 came with 320MB of system RAM, 8MB of which is used by the graphics chip.) In contrast, the Dell (reviewed on page 72) uses Intel's 815 chipset and an nVidia graphics chipset with 32MB of dedicated memory.

Obviously the WinBook formula can't compete with Dell's visual fury—the SiS chipset just doesn't have any legitimate 3D horsepower! How bad does it get? Well, our X1 pumped out single-

**Shell shocked:**  
The X1's sexy aluminum shell doesn't overcome the inadequacies of the SiS chipset.



digit frame rates in *Quake III* at 800x600. Indeed, one shouldn't even consider the SiS a 3D chipset (and we trust that no one would want to play games on a notebook this small anyhow). The X1 also lost to the Dell in our digital audio extraction test—so don't look to this notebook if you want a superlative mobile ripping station.

The X1 also lagged in our new *SYSmark 2001* benchmark. *SYSmark 2001* loads 14 popular applications and runs tasks in them to see how fast a machine is. The new version of *SYSmark* actually runs with several applications open—something most of us do—and measures the response of a rig. Despite having a 1GHz processor, more memory, and the same Win2000 OS, the WinBook actually scored slightly below our zero-point notebook. This may sound alarming, but our zero-point system is a burly Micron Transport GX+ and outclasses the WinBook in size.

In our *Premiere 6.0* benchmark, the 1GHz X1 came up just a few seconds shy of the score posted by our zero-point Pentium 4 desktop system.

The X1 is the first notebook we've ever seen that's wrapped in aluminum.

WinBook says it chose the material because aluminum is better than magnesium or titanium as a heat conductor. Unlike the Dell, which features two exhaust fans, the X1 primarily relies on the aluminum shell to dissipate heat generated by the 1GHz P-III. WinBook's claims may be true. Instead of just the section near the processor getting hot, the heat on the X1 is spread across the entire bottom of the notebook. We have some concerns about the structural integrity and softness of aluminum, but WinBook says there's no reason to worry, as its own tests show that aluminum is plenty strong.

As for battery life, we were able to watch 109 minutes of the director's cut of *JFK* on DVD before the lights went out (only slightly less than the 125-minute score of our zero-point and the Dell). We would have liked the option of adding an additional battery, but no bay is available.

If you can overlook its utter lack of gaming prowess, and the fact that the X1 isn't the end-all, be-all for mobile PC power, this notebook is your ticket to the gigahertz club. And if you're looking for audacious CPU cycles in an eminently portable notebook, you've found your boy.

—GORDON MAH UNG

## UNDER THE HOOD

### THE BRAINS

|                  |                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>CPU</b>       | Intel Mobile Pentium III SpeedStep<br>1GHz/700MHz                                                                                       |
| <b>RAM</b>       | 330MB PC100 SDRAM                                                                                                                       |
| <b>I/O ports</b> | Cardbus PC Card slot, two USB 1.0 ports, PS/2 keyboard and mouse ports, mic-in, head phone, parallel port, serial port, VGA, V.90 modem |
| <b>Modem</b>     | PC Tel V.90 in miniPCI                                                                                                                  |
| <b>LAN</b>       | 10/100 Fast Ethernet in miniPCI                                                                                                         |

### DISPLAY

|                  |                                              |
|------------------|----------------------------------------------|
| <b>Videochip</b> | SiS integrated graphics with variable memory |
| <b>Display</b>   | 12.2-in. XGA                                 |
| <b>Max res</b>   | 1024x768                                     |

### STORAGE

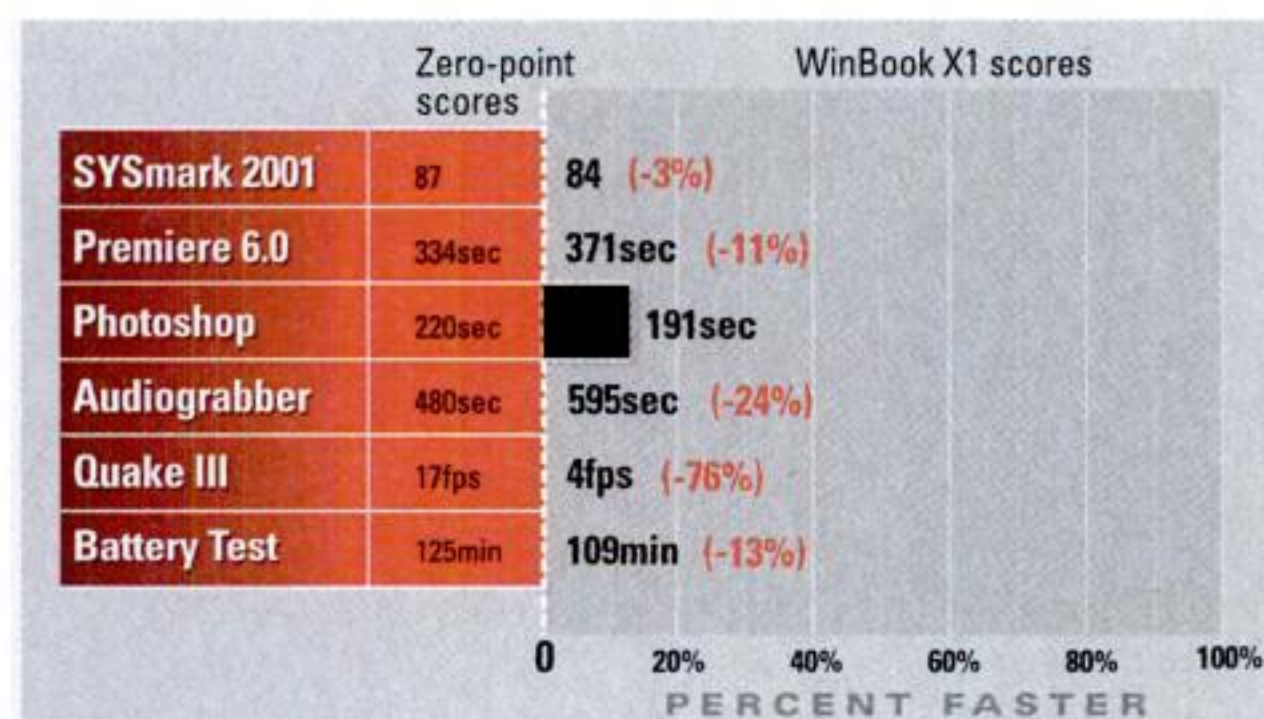
|                   |                        |
|-------------------|------------------------|
| <b>Hard drive</b> | Hitachi 20GB DK23BA-20 |
| <b>DVD-ROM</b>    | TORISAN 8X DRD-U824    |

### SOUND

|                   |                           |
|-------------------|---------------------------|
| <b>Audio chip</b> | SiS 7018 integrated audio |
|-------------------|---------------------------|

### WEIGHT

|                      |                      |
|----------------------|----------------------|
| <b>Lap weight</b>    | 5.1 lbs              |
| <b>Carry weight</b>  | 5.8 lbs              |
| <b>BOOT: 60 sec.</b> | <b>DOWN: 15 sec.</b> |



Full benchmarking details at [www.maximumpc.com/benchmarking/index.html](http://www.maximumpc.com/benchmarking/index.html)

## MAXIMUMPC VERDICT

**X1**  
WINBOOK

### + WHAT WE LIKE

A 1GHz P-III processor that can stay in the running with Pentium 4 desktop systems, and that sleek aluminum case.

### - WHAT WE HATE

Got 3D games? Too bad you can't play them. The sluggish integrated-graphics chipset is annoying.

PHONE 800.254.7806  
www.winbook.com

**\$2,999.00**

**7**



# Hercules Game Theater XP

Any connector in a storm of audio will do

Once soundcard makers realized that computer users wanted to do more with PC audio than just play games, audio hardware started taking on features the way a foundering vessel takes on water in a storm.

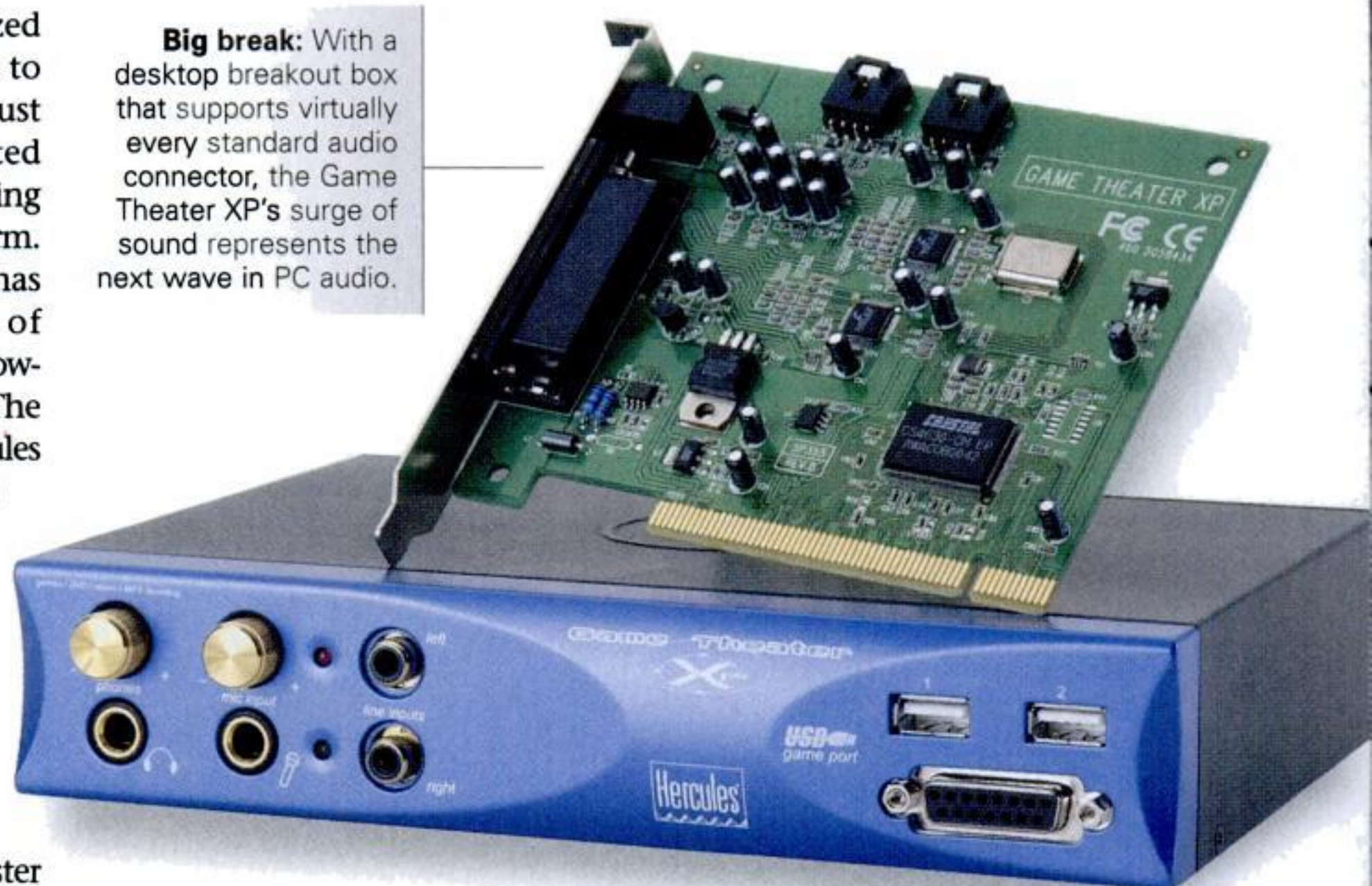
**KICK ASS**  
PRODUCT

A torrent of new features has made the back panel of soundcards awash in rainbow-colored mini connectors. The Game Theater XP from Hercules takes the storm of connectors to Category 4 hurricane level, providing connectors for everything from run-of-the-mill analog speakers to Dolby Digital 5.1 home theater systems.

Managing all those connectors, though, can result in a bothersome flurry of wires around the back of your PC case. The Sound Blaster Live! Platinum moves audio connectors to the front panel of the PC case with the Live! Drive, a breakout box that fits in a CD drive bay and connects to the Sound Blaster Live! PCI card with a ribbon cable. The Game Theater XP goes in a different direction with an external breakout box of considerably higher quality than the Live! Drive. The convenience of the Game Theater XP's solid and stylish blue breakout box, however, comes at a price; forget to bring the external box with the rest of your PC to a LAN party, and you're not gonna hear enemies sneaking up on you—much less blowing off your head.

Built into a rack-mount-ready box, the Game Theater XP breakout connects to the internal PCI card via a six-foot, 44-pin connector cable. On a PC stashed under a desk, the cable lets you move the external breakout box up to the desktop for convenient wiring. The box also offers connectors for almost every current audio input and

**Big break:** With a desktop breakout box that supports virtually every standard audio connector, the Game Theater XP's surge of sound represents the next wave in PC audio.



output standard. The whole thing is bedecked with an attractive, beveled, metallic-blue front panel.

The Game Theater XP's sound quality is as attractive as its connector box. Based on Crystal Audio's CS 4630 DSP chip, the Game Theater XP delivers audio that sounds gutsy and clear. 3D positional sources render perfectly in A3D games such as *Jedi Knight* and EAX games such as *Thief II*. In a 4.1 surround setup, the Game Theater translates both Dolby Digital 5.1 and stereo sources effectively. For Dolby Digital 5.1, the Game Theater really pours on a deluge of sound. Most 5.1 soundcards now come with connectors that pass through a Dolby Digital signal to an off-board decoder-and-speakers set, or connectors that work with an analog 5.1 speaker system. The Game Theater XP makes 5.1 connector schemes on other cards look like afterthoughts. The Game Theater's breakout box accommodates analog 5.1 speaker sets both with the mini connectors stan-

dard on PC surround speakers and with RCA connectors more common for home theater speaker systems. In overall audio performance, the Game Theater unleashes a tidal surge of volume compared to other soundcards—and it also renders crystalline audio imaging that's the best we've heard.

Despite the features and convenience, however, audio production freaks should heed the name. Part of the reason the Game Theater XP sounds great in gaming and home theater setups is that it adds EQ coloration to deliver punch in the bass and shimmer in the high end. The Game Theater also makes other trade-offs—such as trimming wavetable and effects configuration options to free DSP power for audio-stream processing—in order to optimize the hardware for gaming and home theater applications.

Hercules' Game Theater XP is truly the next wave in PC audio. Instead of setting a course for the general purpose desktop, the Game Theater XP's destination is the PC-based entertainment center, whether inside the office, den, or living room.

—ROB PRATT



Optical Dolby Digital 5.1 pass-through connectors and analog RCA connectors on the breakout box mean that the Game Theater XP does DVD home theater with power and clarity.

## MAXIMUMPC VERDICT

Game Theater XP  
HERCULES

### + WHAT WE LIKE

Cool-looking and totally connected breakout box does Dolby Digital 5.1 like nobody's business.

### - WHAT WE HATE

You won't hear enemies coming—or blowing off your head, for that matter—if you forget to connect the box.

PHONE 877.484.5536  
www.hercules.com

\$149.00

9



# VisionTek GeForce3

The 3D revolution will be visualized

A handful of manufacturers delivered prototype GeForce3-based videocards to the Maximum PC Lab as soon as nVidia launched the new graphics processor in late February. But a series of delays (which neither video-card vendors nor nVidia would discuss) kept the new boards off of retail shelves while manufacturers worked to perfect designs. Until now, VisionTek's GeForce3 is the first final-edition GeForce3-based video-card to reach the Lab's static-discharging threshold.

Does the VisionTek GeForce3 live up to the performance promise of programmable pixel shaders? Absolutely. In fact, it's the first truly revolutionary 3D accelerator we've seen since... well, since the first 3D accelerators for PCs arrived in 1996.

All other 3D accelerators require data to be sent through a very inflexible processing pipeline. By contrast, the GeForce3's pipeline is fully programmable. This allows developers to load applications on the graphics processor and run them there, freeing the CPU for things like AI and sound processing. This opens the door to a world of cool new 3D effects. Real-world water effects—one of the toughest visuals for other 3D accelerators—require just a few lines of code with the GeForce3.

The VisionTek GeForce3 comes with a 200MHz core and 64MB of 230MHz DDR memory. If you keep track of such things, you'll notice that this core is slower than the 250MHz core of the GeForce2 Ultra. This means that a GeForce3 performs a bit slower than a GeForce2 Ultra in less-punishing benchmarks (such as *Quake III Demo* 001), which don't tax the video-card's memory bus. If the video-card's memory bandwidth is saturated, as in our demanding *Quake III Maximum PC* demo, then memory optimizations in the GeForce3's memory controller push the card ahead in benchmarks.

Speaking of benchmarks, our new set of video-card benchmarks ditches the familiar faces of *MDK2* and *SYSmark2000*. In their stead, we now run our own *Quake III Arena* demo (created with *PC*

**Hot and heavy:** Like the GeForce2 and GeForce2 Ultra before it, the GeForce3's memory runs so fast and hot that it needs big, passive heatsinks.

**VisionTek's GeForce3 is the future of 3D accelerators, but you don't need one right now.**

*Gamer's Padshop* map; check out its insane texturing demands!) as well as two tests from the *3DMark2001* suite (Game 2 tests Direct3D performance in a traditional 3D pipeline, while Game 4 tests the pixel and vertex shaders of next-gen, DirectX 8-compatible hardware). We top off our new benchmarks with the pixel-shader-stressing DirectX 8 *Aquamark* benchmark.

While the GeForce3 is slower than a GeForce2 in older games, the GeForce3 registers kick-ass performance in games that use programmable shaders. In our new *Aquamark* benchmark, the VisionTek card is four times faster than GeForce2 Ultra cards, and it runs with much higher detail settings. Game 4 from *3DMark2001*

won't even run on Ultra-based boards—but this test hit a sobering 14.2fps running on the VisionTek card. When we eventually see game ports from the Xbox to the PC, the highest-detail settings in these titles will require GeForce3-caliber hardware.

After speed, our main concerns with any new 3D accelerator are stability and compatibility. To test stability, we loaded *3DMark2001* in a looping demo mode. The VisionTek GeForce3

played the loop for 16 hours without incident. To test compatibility, we ran a series of diverse games, ranging from new titles (such as *Black & White*) to classics (such as *The Sims*). We didn't experience any compatibility issues.

The primary problem with the GeForce3 equation is the scarcity of games that take advantage of the new technology's advanced features. We've yet to see them on store shelves. This will certainly change, but not before late summer at the earliest. Unless you're playing games that use programmable shaders, there's no reason to buy a GeForce3 video-card.

That stated, we couldn't be happier with VisionTek's GeForce3 as an example of its breed. It's a rock-solid card that performs on a level with the best videocards in current 3D games. And it will only get better as more games take advantage of the card's programmable shaders. Videocards like VisionTek's GeForce3 will let you see every detail as the next revolution in 3D acceleration takes control.

—WILL SMITH



## The Specs

|              |                                  |
|--------------|----------------------------------|
| RAMDAC       | 350MHz                           |
| Core Speed   | 200MHz                           |
| Memory Speed | 230MHz DDR<br>(460MHz effective) |

| Raw Data                       | VisionTek GeForce3 |
|--------------------------------|--------------------|
| Quake III MaxPC Demo           | 51.4fps            |
| 3dMark2001 Game 2: Dragolothic | 34.5fps            |
| 3dMark2001 Game 4: Nature      | 14.2fps            |
| Aquamark                       | 23.5fps            |

Note: The test system used the 12.0 drivers from VisionTek. All benchmarks run with vsync and FSA disabled. 3DMark2001 runs with "D3D Pure Hardware" selected. No videocards were harmed in the making of this review.

**MAXIMUMPC VERDICT**

**GeForce3**  
VISIONTEK

**+ WHAT WE LIKE**  
This video-card is fast and as future-proof as they come. Programmable shaders are capable of stunning effects.

**- WHAT WE HATE**  
There are currently no games shipping that make use of the GeForce3's advanced features.

PHONE 800.726.9695  
www.visiontek.com

**\$400<sup>00</sup>**

**10**



# Clash of the Combo Drives

Do-it-all optical drives pick up the pace

**P**erformance usually comes at a price. For combination DVD/CD-RW drives, the price of getting a single unit that does everything—from burning MP3 CDs to playing DVD movies—has been sluggish read and write speeds. The second generation of combo drives, however, brings all-in-one units up to speed. With new DVD/CD-R/W drives from Samsung and Hewlett-Packard, you can have it all. Well, almost.

The two drives reviewed here both offer overall performance that stacks up favorably against the best CD-RW drives. But they also share a fatal flaw: no buffer-underrun protection! Sanyo's Burn Proof and Ricoh's JustLink

technologies intelligently control CD burns, stopping the recording process before it generates errors when write buffers run out of data. Without this protection,

combo drives are crippled in disc-to-disc copying and are vulnerable to write errors during regular disc burning.

## HP CD-WRITER DVD COMBO 9900CI

The specs on HP's first combo drive look like a Kick Ass waiting to happen. With 12x CD recording, 4x CD rewriting, 32x



**HP's first combo drive, the 9900ci, comes in an attractive case and with an attractive software bundle, but ugly performance scores make it a total dog.**

CD reading, and 8x DVD reading, the Combo 9900ci should have blown the doors off our *CD Speed* benchmark and then topped things off by chilling out with *Charlie's Angels* on DVD.

Despite fast seek times, however, the HP didn't even come close. Part of the Combo 9900ci's problem is *MyCD*, the palsyware burning application bundled with the drive. In our data CD burn test, the drive barely edged the much-slower-on-paper Samsung unit. However, using different burning applications, such as Ahead's *Nero* and Roxio's *Easy CD Creator*, we were able to shave another three minutes off the HP's burn-test score.

The 9900ci also had issues reading the outer edge of the 72-minute CD we use for audio extraction testing. *CD Speed* reported errors in audio extracted from the outermost track, as well as heavy CPU utilization at higher read speeds.

## SAMSUNG RW COMBO SM-308

In stark contrast to the HP drive, Samsung's modest 8/4/32/8 drive exceeded all expectations. In both audio and data transfer, the SM-308 posted scores in a league with the best CD-RW drives. Transfer rate averages of 20.90x put the Samsung in the same pack as TDK's Kick Ass 16/10/40 VeloCD CD-RW. In digital audio extraction, the Samsung lags behind the VeloCD by

only four seconds.

But the SM-308 falls way short on bundled software. Combo drives are all about features, and the software bundle should reflect an all-in-one product. Yet Samsung only packages CyberLink's *PowerDVD* and Roxio's *Easy CD Creator* and *Direct CD*. On the flipside, despite the inane *MyCD* burning application, HP's bundle is quite good: It includes ArcSoft's *Photo Center* and *Video Impressions*, *MusicMatch Jukebox*, Sonic Foundry's *ACID* and, of course, *PowerDVD*.

With manufacturers turning out solid-performing combo drives (like Ricoh's Kick Ass 12/10/32/8), all-in-one optical drive units look like they're soon going to have enough speed to become first-choice components in the best PCs. But they're not there yet.

—ROB PRATT

| DARE to COMPARE              | HP Combo 9900ci | Samsung SM-308 |
|------------------------------|-----------------|----------------|
| Average data transfer        | 16.96x          | <b>20.90x</b>  |
| Random/full-stroke seek (ms) | <b>91/165</b>   | 100/185        |
| Audio extraction (secs)      | 288             | <b>255</b>     |
| Data CD burn (secs)          | <b>636</b>      | 687            |

Best scores are bolded. For our data CD burn test, we use the CD mastering software that comes bundled with each drive.



**Samsung's SM-308 combo drive far exceeds the performance that its modest speed numbers suggest. But that's still not saying much.**

**MAXIMUMPC VERDICT**

**CD-Writer DVD Combo 9900ci**  
HEWLETT-PACKARD

**+ WHAT WE LIKE**  
Despite the palsied *MyCD* burning application, the software bundle, including Sonic Foundry's *ACID* and *MusicMatch Jukebox*, is quite good.

**- WHAT WE HATE**  
The specs look good, but the benchmark performance numbers don't.

PHONE 888.999.4747  
www.hp.com/go/9900ci

**\$349.00**

**6**

**MAXIMUMPC VERDICT**

**RW Combo SM-308**  
SAMSUNG

**+ WHAT WE LIKE**  
For a modest drive, the SM-308 performs with the best in digital audio extraction and data transfer speed.

**- WHAT WE HATE**  
The wait for a CD to burn at 8x speed is all the more tedious when there's little bundled software for diversion.

PHONE 800.726.7864  
www.samsungelectronics.com

**\$199.00**

**7**



## Winner of Maximum PC's "Clash of the Gaming Titans"

*In terms of pure price-to-performance ratio, Falcon takes the cake.*

*Because the Falcon won every benchmark, the scores of the other machines are represented as percentages of the Falcon's scores...*

*In this roundup, the best system is also the least expensive.*

**Maximum PC**  
May 2001

*The Falcon Northwest Mach V demonstrates the most consistently strong performance across all tests. the Mach V beat out the Alienware Aurora DDR system in all the 3D game tests by a steady 5 percent*

**Gamespot Hardware**  
**Clash of the Titans Faceoff**  
April 2001

*what you get uniquely from Falcon Northwest is their exquisite craftsmanship. Open the case, and it's so clean and neat you'd think it wasn't fully built yet.*

*...it's wicked fast, built with loving care from quality components, intricately documented, and backed by fantastic support.*

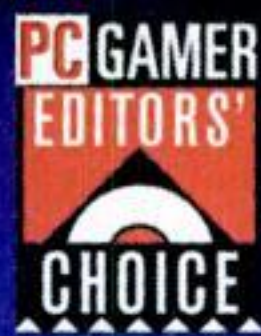
**Computer Games Magazine**  
May 2001

## FALCON NORTHWEST

*Kicking other PC's Butts since 1992.*

*all our hardware fantasies came true when Falcon Northwest brought in what could only be considered every gamer's dream system. ...we haven't been this excited in months!*

**PC Gamer**  
May 2001



May 2001



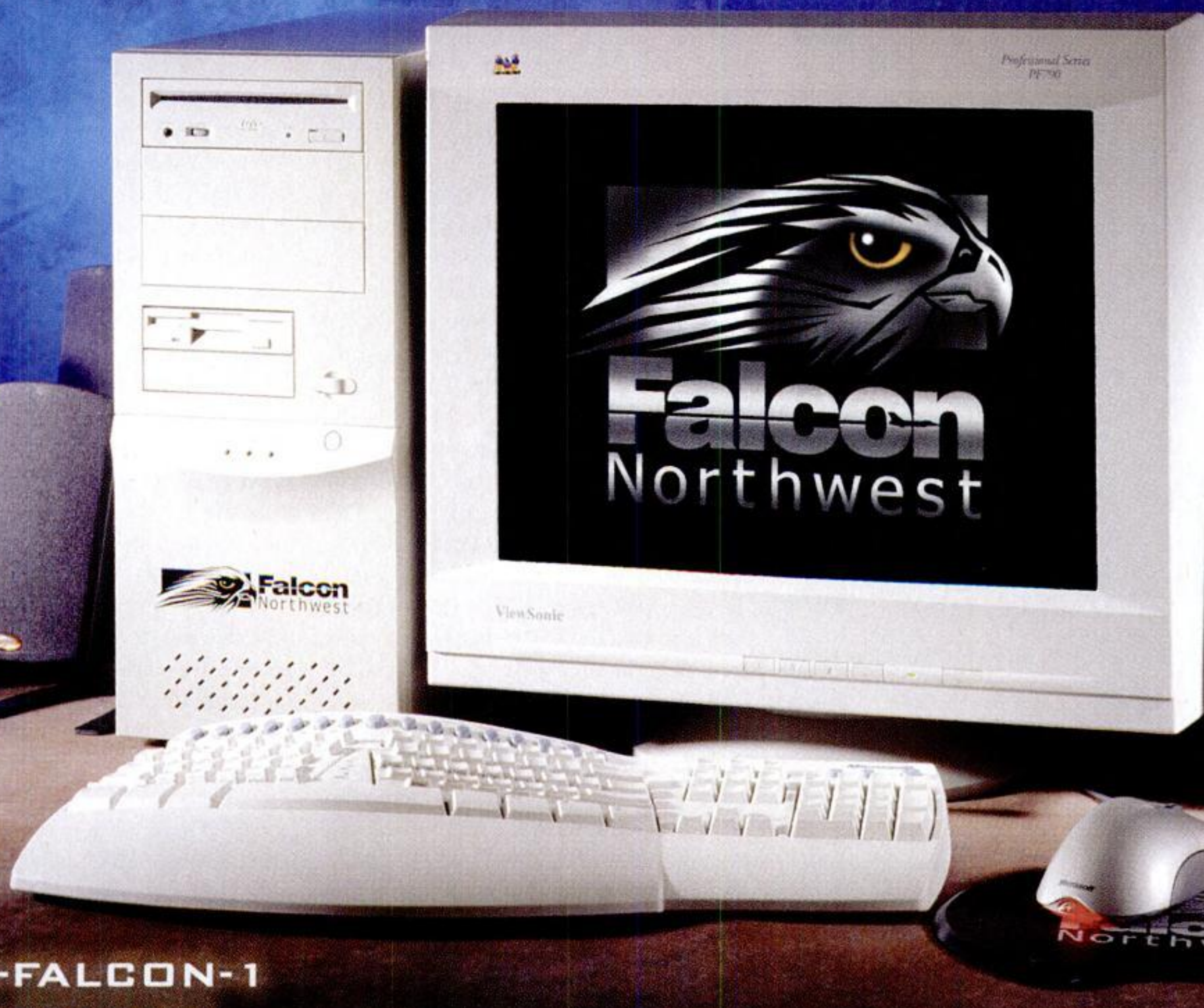
May 2001



June 2001

*It's hard not to recommend the Mach V. It's a super-fast machine and building it yourself would easily set you back another \$1000!*

**Computer Gaming World**  
June 2001



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# Sony VAIO Digital Studio

Creativity system stakes a claim on the new PC frontier

**P**Cs began a strong migration to the traditional consumer electronics arena at last year's Fall Comdex 2000. By January's Consumer Electronics Show, the movement had grown to a stampede of system and peripheral vendors integrating their PC hardware with the snazzy audio/video devices that are more Circuit City than CompUSA. But

as those Johnny-come-lately vendors were beginning to embrace what Intel CEO Craig Barrett calls the "extended PC era," many found that Sony had beaten them to the land of opportunity.

Sony's VAIO Digital Studio doesn't represent just a humble homestead in the promised land of PC and consumer electronics integration. It's more like a thriving township, with a specialized DV-editing workshop that's outfitted with a full set of tools. Unfortunately, the latest Digital Studio, like predecessors we've reviewed in the past, is also stuffed with a few pieces of basic hardware that don't live up to the promise of the excellent DV-authoring products bundled in.

Though it includes the fastest CPU on the market, the Digital Studio lags behind similarly outfitted systems in the benchmarks that gauge overall system performance. Its

**The streamlined exterior (and crappy speakers) hide a digital video-editing system ready to plug into a home studio.**

## UNDER THE HOOD

### THE BRAINS

|           |                                                                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|
| CPU       | Intel Pentium 4 1.5GHz                                                                                                           |
| RAM       | One 128MB Rambus Direct RDRAM RIMM                                                                                               |
| I/O ports | Four USB (two front/two rear), serial, parallel, 6-pin i.LINK (FireWire), 4-pin i.LINK (FireWire), PS/2 keyboard and mouse ports |

### DISPLAY

|                  |                                    |
|------------------|------------------------------------|
| Videocard        | AsusTek V7100                      |
| Display          | Monitor available but not reviewed |
| Refresh@ max res | N/A                                |

### STORAGE

|            |                                 |
|------------|---------------------------------|
| Hard drive | 80GB Maxtor DiamondMax, 5400rpm |
| DVD-ROM    | Pioneer 4x DVD-116-R            |
| CD-ROM     | Sony 12/8/32 CRX160E            |

### NETWORKING

|       |                         |
|-------|-------------------------|
| LAN   | Onboard 10/100 Ethernet |
| Modem | Generic V.90 56K PCI    |

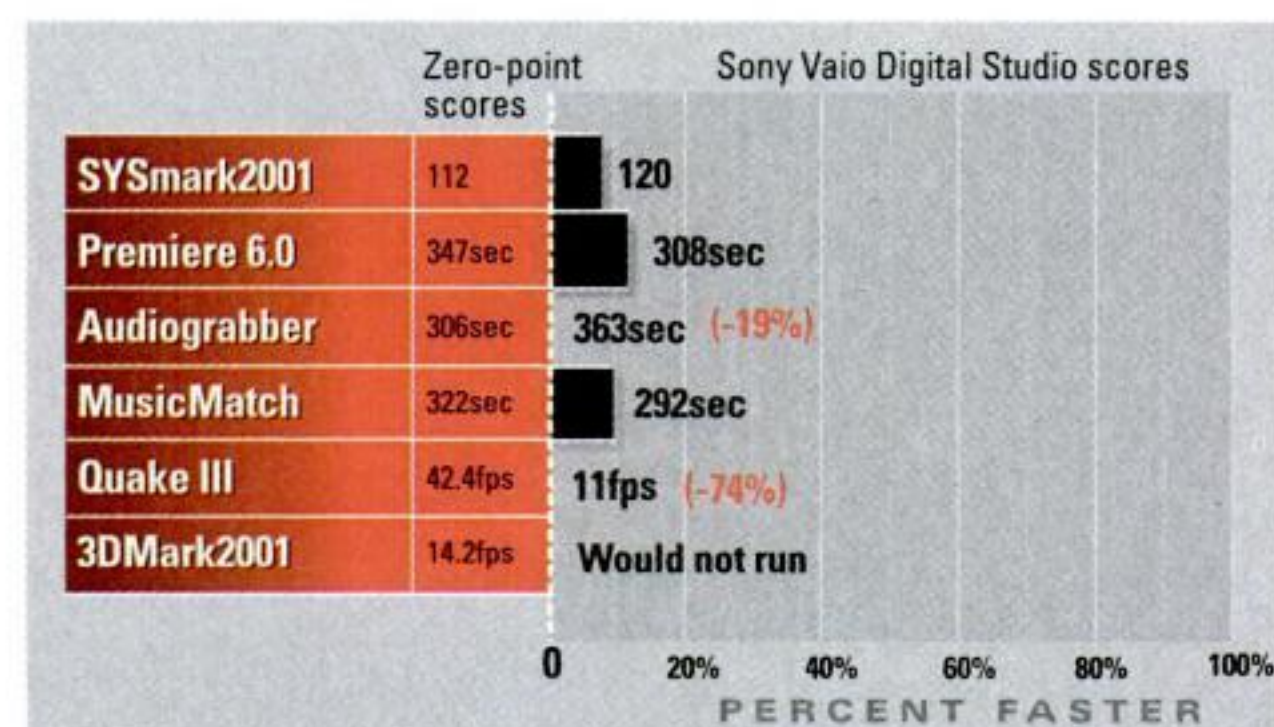
### SOUND

|  |                      |
|--|----------------------|
|  | Onboard, stereo only |
|--|----------------------|

### THE BUNDLE

Windows ME, Adaptec Direct CD, Adaptec Easy CD Creator, Adobe PhotoDeluxe, Adobe Premiere LE, ArcSoft PhotoPrinter 2000 Pro, Intuit Quicken 2001 New User Edition, Corel WordPerfect 9, McAfee VirusScan, Word 2000, Sonic Foundry Sound Forge XP, Sony DVgate, Sony Media Bar, Sony MovieShaker, Sony OpenMG, Sony Jukebox, Sony PictureGear, Sony Smart Capture, Sony VisualFlow, Tomb Raider Chronicles

**BOOT: 45 sec. DOWN: 12 sec.**



Full benchmarking details at [www.maximumpc.com/benchmarking/index.html](http://www.maximumpc.com/benchmarking/index.html)



*SYSmark2001* score of 120 is almost 20 points below Intel's 1.5GHz Pentium 4 reference system. So why the sluggish pace? Look no further than the skimpy 128MB of PC800 Rambus Direct RDRAM and slow-spinning, 5400rpm Maxtor DiamondMax hard drive. However, we do have to give credit to Sony for choosing a drive with a spacious 80GB capacity—and for knowing enough about digital video to set up the drive with two partitions. Non-linear digital video editing quickly fragments the partition where editing applications build preview files, so two partitions are always preferred.

The GeForce2 MX-based AsusTek V7100 videocard is a solid choice for digital video editing. With both a standard analog connector and a DVI connector for digital displays, the Studio quickly connects to a home-based video editing environment—use the digital display for editing and an analog CRT display for previewing and playback. Unfortunately, the GeForce2 MX doesn't keep up in 3D gaming. The system barely ran our *Quake III* benchmark, turning in an unplayable 11fps at 1280x1024.

Also unfortunate is Sony's stance on recordable DVD. Sony has committed itself to the DVD+RW standard (which isn't ready for prime time), so the Studio doesn't come with a recordable DVD burner. (DVD-R, meanwhile, is currently available in systems from Compaq.) This is a shame. A digital studio such as the VAIO is in dire need of an all-in-one, shoot-to-burn system for digital video.

But we can't complain about Sony's

convenient hardware interfaces for DV cameras as well as digital cameras and MP3 players, or the bundle of multimedia authoring software. Sony builds its proprietary i.LINK FireWire connectors into every VAIO, but we tested the system with a *non-i.LINK* Canon ZR-10 FireWire DV camcorder, and everything worked just fine. Once plugged into the system, we had instant access to all clips on the camcorder. Sony's *Movie Shaker* video-editing application, meanwhile, made quick work of compiling clips with rudimentary transitions (and some truly cheesy special effects). Sony's *Visual Flow* is also inspiring. It's a visually oriented filesystem browser that has an eerily similar feel to the multimedia browser capabilities built into Apple's new OS X operating system. Because neither of these apps would prove useful for hardcore DV enthusiasts, Sony also bundles Adobe's *Premiere 5.0LE* and Sonic Foundry's *Sound Forge 4.5 XP*.

Other system OEMs are exploring the extended PC frontier, but none are as focused on the exploration as Sony. The VAIO Digital Studio is a settlement that reveals where other PC manufacturers will be setting up camp in the future.

—ROB PRATT

## MAXIMUMPC VERDICT

**VAIO Digital Studio**  
SONY

### + WHAT WE LIKE

Literally dozens of ways to view, manipulate, edit, and transfer digital images and video. Lots of connectors for integration with DV cameras—and lots of other gadgets.

### - WHAT WE HATE

Suffers sluggish performance; upgrades for speed might be inevitable. And where's the DVD burner?

PHONE 800.571.7669

[www.sonystyle.com/vaio](http://www.sonystyle.com/vaio)

**\$2,199<sup>00</sup>**

**7**



# Have Hard Drive, Will Travel

Is that 20GB in your pocket?

**T**ransferring files from PC to PC or to a laptop used to be a no-brainer. Pop the info onto a 3.5-inch disk and go. But file sizes keep growing, and it hasn't taken long for devices such as Zip disks, tape drives, and even CD-RW drives to become too small, too time-consuming, and much too inconvenient. Portable hard drives bridge the gap between removable media drives and network-server storage, offering 10GB to 30GB (or more) of readily available storage. Once connected through a USB or FireWire port, they show up on a PC's filesystem just like any other drive. With one of these go-anywhere, quick-connect drives, you can back up an entire PC or laptop in minutes, transfer files, or just share files between your work computer and home PC quickly and easily. Best of all, some come in such a small case that you can slip it into a jacket pocket on your way out the door.

## BUSLINK USB HARD DRIVE

The first model we looked at was Buslink's USB external hard-drive. Mac versions are blue and PC versions are yellow. Both are metal, sturdy, and stackable, so if you need more storage later, you can keep adding new drives until you blow a wall socket or



**Buslink's USB hard drive will back up 20GB in 30 minutes—and if you need more capacity, plug in another drive and stack it up.**

run out of USB ports. The Buslink ranges in size (at press time) from 10GB to 60GB. It connects easily and has a handy on/off switch that makes it a perfect backup drive. At only two pounds, it isn't inconvenient to put it into your briefcase and go. Since it uses USB, the speed of the drive hovers around 1 to 8MB/sec, which is fast enough to back up a full 20GB drive in 10 to 30 minutes. And the MSRP of \$199 for the 20GB model isn't that much more expensive than an internal drive.

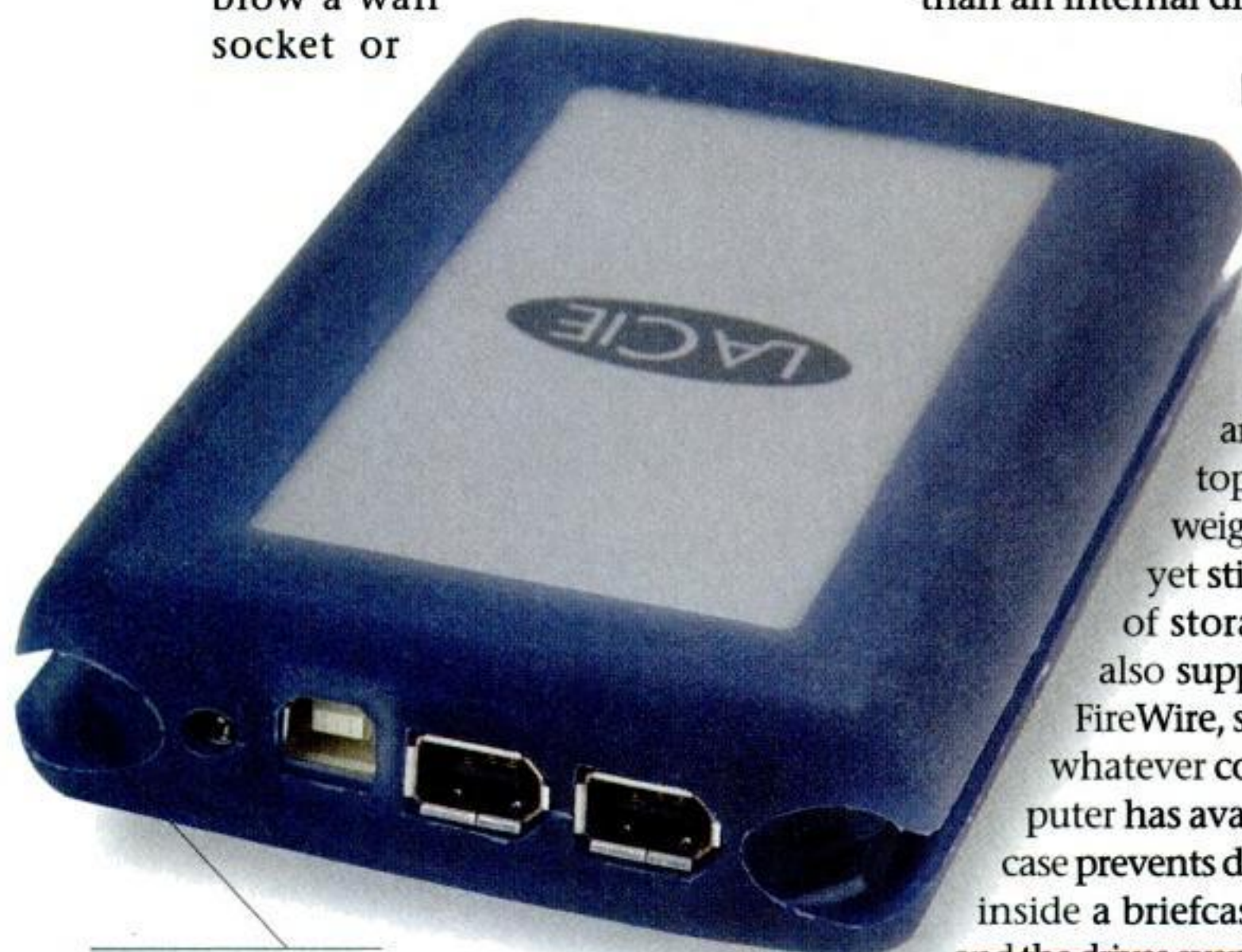
## LACIE POCKET DRIVE

Lacie targets notebook users and people who want to swap large amounts of data among multiple desktops. The Pocket Drive weighs less than a pound yet still offers up to 30GB of storage. Lacie's model also supports both USB and FireWire, so you can easily use whatever connector your computer has available. A rubberized case prevents damage from jostling inside a briefcase or jacket pocket, and the drives even sport handy grooves carved into their sides to protect USB or FireWire cords. Speed is comparable to the Buslink in USB, but (obviously)

FireWire is much faster—12 to 15MB/sec on average, and connecting/re-connecting is a snap. The MSRP of the 20GB model is a whopping \$429, however.

The difference between the two drives is obvious, so much so that they're pretty incomparable. The Lacie is more portable than the Buslink, and its FireWire option makes it much faster, too. (As an added bonus, it also works on the Mac and is set up to integrate with Sony's VAIO desktops and laptops.) It's handier for bringing your work home, not to mention the sheer coolness of having 30GB of information in your jacket pocket. But that sort of conversation-starter comes at a stiff price. If your primary use for the drive is just backing up files or storing prohibitively large files in your home or office, the Buslink should do just fine.

—ANDREW S. BUB



**Fast and faster:** Lacie's Pocket drive offers both USB and blazing-fast FireWire connectors. The slots on the sides keep cords all wrapped up.

| MAXIMUMPC VERDICT                     |                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>USB Hard Drive</b><br>BUSLINK      |                                                                                                             |
| <b>+ WHAT WE LIKE</b>                 | Plug-and-go USB connection and stackable cases. And it's tough and convenient for home and home-office use. |
| <b>- WHAT WE HATE</b>                 | Heavy-duty case means that it's just plain heavy—and not exactly portable.                                  |
| PHONE 626.336.1888<br>www.buslink.com |                                                                                                             |
| <b>\$199<sup>00</sup></b> 20GB        | <b>\$399<sup>00</sup></b> 60GB                                                                              |
| <b>8</b>                              |                                                                                                             |

| MAXIMUMPC VERDICT                   |                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Pocket Drive</b><br>LACIE        |                                                                                                            |
| <b>+ WHAT WE LIKE</b>               | Connectors for USB or FireWire, rubberized case, and groovy cord wrap. And it's extremely small and light. |
| <b>- WHAT WE HATE</b>               | It's expensive, which means you trade your wallet for wallet-sized portable storage.                       |
| PHONE 503.844.4502<br>www.lacie.com |                                                                                                            |
| <b>\$329<sup>00</sup></b> 10GB      | <b>\$699<sup>00</sup></b> 30GB                                                                             |
| <b>9</b>                            |                                                                                                            |



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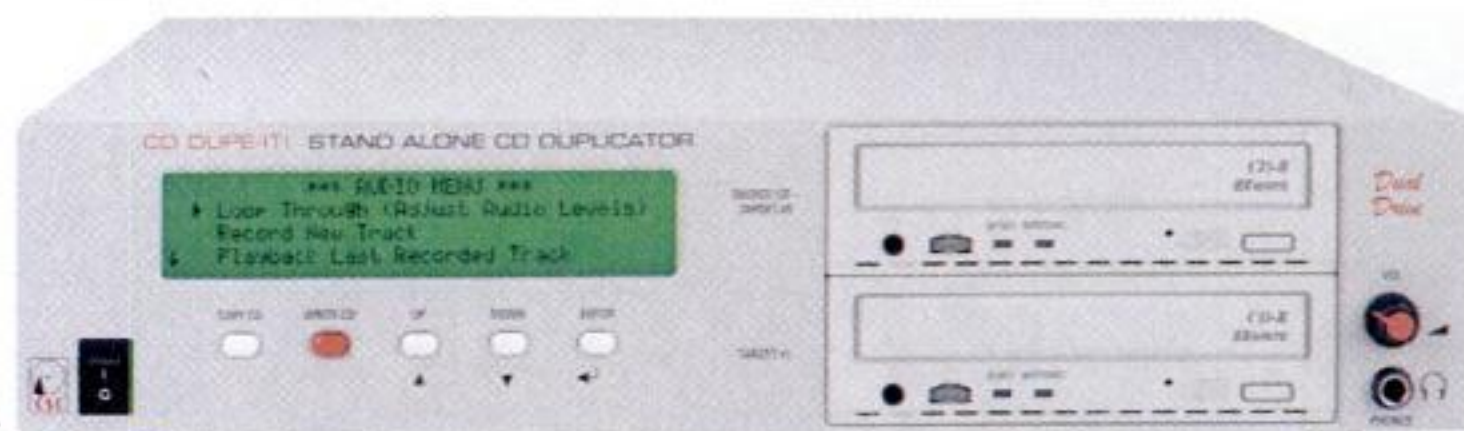
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# Diamond Mako

Put away your pen—this PDA's all thumbs

**W**ith giants like Palm, Handspring, and Compaq battling for mind-share in the PDA market, we didn't expect much from Diamond. Better known for its line of Rio MP3 players, Diamond also produces the Mako—and, believe it or not, this handheld device is not a disposable piece of junk that you pick up while waiting in the checkout line at CompUSA.

**KICK ASS**  
PRODUCT

Indeed, Diamond's Mako is much more. Based on the 5.01 release of the Symbian EPOC OS, the Mako is a full-featured PDA that boasts hardware and software elements that the more popular PDAs should include.

People familiar with Psion PDAs should recognize the Mako right off. In fact, as far as we can tell, the Diamond Mako is nothing more than a Psion Revo Plus with "Diamond" silk-screened on the case. That's not a dis against Psion or Diamond, mind you; the Revo Plus/Mako is an impressive unit.

The most striking characteristic of the Mako is its tiny keyboard. For people who believe a true PDA should employ a stylus for data-entry, the Mako

will be a turn-off. But for anyone frustrated by the penmanship requirements of Palm OS and Pocket PC units, the

Mako is the perfect alternative.

Too small for touch-typing, the Mako keyboard requires you to learn the art of thumb-typing. Grasp the Mako on both ends and go for it. The keyboard boasts a normal QWERTY layout for alphabetic and numeric characters, but uses combination keys for other characters. To enter a hyphen, for example, you have to hit Function plus

**Hunt and peck:** The QWERTY keyboard precludes potential hassles with Graffiti text-entry or sketchy handwriting recognition—but you'll have to use your thumbs.

O, which gets pretty annoying after a while.

The screen itself offers a generous amount of space for such a small

PDA. At 480x160 resolution, it's a pleasant change from the Palm's 160x160. The 16-shade grayscale display is fairly easy to read under dim office lighting, but is not as legible as the Palm Vx's grayscale screen under the same conditions. In total darkness, you're out of luck—for some odd reason, the Mako has no backlighting at all. The screen is also touch sensitive, so you can tap through prompts with your fingernails. A small stylus is included for people without fingernails.

Some of the strongest pluses of the Mako are the third-party applications. With the EPOC OS a hit in Europe, the developer support seems as strong as with the Palm OS here in the states. We had no problems installing the wealth of games and applications. One thing we do ding the Mako for is the lack of a desktop application. Instead

**Get horizontal:** The screen has lots of landscape, but without a backlight, it goes dark as the desert at night.



| THE SPECS      |                                          |
|----------------|------------------------------------------|
| Screen res     | 480x160                                  |
| Viewable image | 4.5 x 1.9 in.; 16-shade grayscale screen |
| Processor      | 33MHz ARM RISC                           |
| Memory         | 16MB                                     |
| Dimensions     | 6.1 x 3.1 x 0.78 in.                     |
| Bundle         | Epoc Connect 5.01                        |

of giving you a full-fledged organizer on your desktop box, the Mako expects you to use Outlook or Lotus Organizer. There's plenty to like about the Mako's applications. The device comes with a Word-compatible text processor, as well as a very robust spreadsheet application that does graphing. In fact, we think using a spreadsheet on the Mako's horizontal screen is a far more satisfying experience than on any pen-based unit we've tested. An optional printer port adapter lets the Mako print to many standard desktop printers.

We know most Americans tend to prefer pen-based PDAs. But for folks who never quite got the hang of Graffiti, the Mako is worth a serious look-see.

—GORDON  
MAH UNG

## MAXIMUMPC VERDICT

Mako  
DIAMOND

### + WHAT WE LIKE

Lots of landscape on a horizontal screen makes for satisfying spreadsheet manipulation.

### - WHAT WE HATE

No backlight means that thumb-typing in a dark alley is out of the question.

PHONE 800 468 5486  
www.diamondmako.com

\$300<sup>00</sup>

9



# Visor Edge

New Palm V-killer might be the sexiest PDA ever

It's no surprise that Handspring's latest model mimics the sleek lines of Palm Computing's best-selling Palm Vx. The common denominator of the two manufacturers is Handspring chairman Jeff Hawkins, who designed the Palm Vx before he started his own company. Hawkins reached even deeper into his bag of stylish PDA tricks to create the new Visor Edge, the sexiest PDA to hit the scene since Compaq's iPaq.

Unlike the iPaq, the Edge doesn't use Microsoft's Pocket PC operating system. Instead, it employs Palm OS, which is far faster and much easier to use. Handspring loads Palm OS version 3.5 on the Edge, as well as several add-ons, such as *Datebook+* and a one-handed contact-search feature. Unfortunately, the OS itself isn't upgradeable on Handspring Visors (a shame because you can upgrade the OS on the higher-end PDAs from Palm Computing).

Though it's actually slightly thicker than a Palm Vx, the Edge feels and looks slimmer, thanks to an ultra-thin aluminum lid. A cool-white LED at the lower-right of the unit lights up when the Edge charges on its cradle. The LED also blinks as an alarm reminder. Noticeably missing from the exterior is the much-ballyhooed Handspring Springboard port. Handspring had to shed this bulky connector when it moved to a slimmer chassis. So the Visor Edge uses a new Edge port that can accept Springboard modules via an included adapter—a bulky affair at best.

Considering that Handspring is encouraging developers to design new products for the Edge port, and that Palm Computing's new models use an SD port, we predict that Springboard may be headed the way of the dodo. Confusing matters further, Handspring also changed the cradle adapter, which makes the Edge incompatible with Targa's popular Stowaway keyboard. Message to PDA-makers: Standardize one cradle connector or

**Whiter whites.** The Edge's screen is relatively white—a nice departure from the yellowish screens of the older V, Vx, and Illxe Palms.

risk pissing off your entire user base.

Internally, the Edge uses the same 33MHz Motorola CPU found in the new Palm M505 and the Visor Prism. However, Handspring gives the Edge a performance boost with efficient internal plumbing. Using the *Quartus.Net* benchmark for Palms, the Edge finished a Fibonacci sequence in less time than the Prism, even though both have the same CPU. The Edge is just plain snappy.

The Edge also eschews AAA batteries in favor of lithium ion cells, which provide battery life that's comparable to the Edge's grayscale Palm counterparts. The stylus is wonderfully shaped, but it doesn't slip inside the unit. Instead, it clips onto the side—an elegant-looking solution, but uncomfortable to hold.

If Handspring's overall aim is to snipe at the Palm Vx, the Edge looks like a killer. Expandability, design, and speed give it a definite leg up on the Vx. But considering that Palm's new M505 and M500 introduce SD-card compatibility (for storing applications on

swappable media), we have to rank the Edge as the bronze metal winner in a three-Palm PDA race.

One snag may give the Edge a lead over the new Palms, however, and that is Palm's delays in getting the M500 and M505 produced in quantity. If you can't get a newer Palm and you're not willing to wait, we'd recommend the Edge over the slower and non-expandable Palm Vx any day.

—GORDON  
MAH UNG



**The Edge's style, speed, and expansion make it better than a Palm Vx.**

## THE SPECS

|                |                                            |
|----------------|--------------------------------------------|
| Screen res     | 160x160                                    |
| Viewable image | 2.25 x 2.25 in.; 16-shade grayscale screen |
| Processor      | 33MHz Motorola Dragonball VZ               |
| Memory         | 8MB                                        |
| Dimensions     | 4.7 x 3.1 x 0.44 in.                       |
| Bundle         | Palm Desktop Software, Pocket Mirror 3.0   |

## MAXIMUMPC VERDICT

Visor Edge  
HANDSPRING

### + WHAT WE LIKE

The lovely looks of a metal case don't come with a performance let-down—this sexy number is fast!

### - WHAT WE HATE

What's with the bulky expansion adapter?

PHONE 888 565 9393  
www.handspring.com

\$400<sup>00</sup>

8



# Plug and Play

Rumble, flash, and fire your PC

## RumbleFX Headphones

PC upgraders know Evergreen Technologies for making PCI cards that let older motherboards run newer processors. The company now moves into PC gaming accessories with the new RumbleFX force-feedback headphones, a product meant to let you feel the bass—literally. Considering the poor build quality of the phones, Evergreen might be better off sticking to PCI upgrade boards.

**WHAT WE LIKE:** Despite the lack of care in packing them (the review unit we received had scratches and rips in the ear pads), the headphones demonstrated good audio fidelity. They pack a punch in movies and games, letting you truly feel music and sound effects in the familiar force-feedback tradition.

**WHAT WE HATE:** The rumbling sensation is amusing at first, but quickly becomes tedious when the headphones start rattling from poor construction.

—TUAN NGUYEN

### MAXIMUMPC VERDICT: 5

\$59, Evergreen Technologies, [www.evergreennow.com](http://www.evergreennow.com), 541.757.0934



## USR 56K V.92 Modem

The limitations of analog-data transfer over standard copper telephone wires have prevented dial-up web surfers from seeing significant speed increases in years. The broadband revolution still hasn't reached many of us, and though it's *soooo* 20th century, U.S. Robotics' latest upgrade to the 56K modem—thanks to the new V.92 modem standard—promises the analog hordes quicker connection times and faster uploads. (Most existing V.90 modems can be upgraded to V.92 with a firmware update.)

**WHAT WE LIKE:** The V.92 modem set a new *Maximum PC* record by squeezing out a few more kilobits per second than the last record holder. Options to optimize speed for downloading or uploading give you precise control over precious bandwidth resources.

**WHAT WE HATE:** None of the incremental speed improvements work unless your ISP also supports V.92.

—ROB PRATT

### MAXIMUMPC VERDICT: 8

\$149, U.S. Robotics, [www.usr.com](http://www.usr.com), 866.287.7669



## Logitech Cordless MouseMan Optical

The introduction of optical sensing revolutionized the lowly computer mouse, which had remained mechanically unchanged for 20 years. Now Logitech's brand-new Cordless MouseMan Optical introduces another revolutionary upgrade in mouse technology: reliable wireless connectivity.

**WHAT WE LIKE:** Fast sampling gives the Cordless MouseMan Optical enough precision for demanding, up-close work in *Photoshop* and enough quick-response for fast action in *Quake III*. Power-saving features restore the optical sensor to maximum resolution in a split second when the sleeping mouse receives a wake-up jiggle.

**WHAT WE HATE:** Adding a pair of AA batteries to the body of the mouse means that the Cordless MouseMan Optical rides higher than most wired mice. Also, the limited receiver range won't cut it for across-the-living-room use in PC-based entertainment centers.

—ROB PRATT

### MAXIMUMPC VERDICT: 9

\$74.95, Logitech, [www.logitech.com](http://www.logitech.com), 800.231.7717



## Pyro 1394 WebCam

Unlike most cheapo webcams, the Pyro hooks up to your PC's FireWire port. Why does a simple webcam need the bandwidth FireWire provides? Simple:

Unlike most other webcams, the Pyro transmits 0.25-inch CCD sensor images across the FireWire bus without compression. The result is excellent image quality. In fact, the Pyro 1394 WebCam is totally overpowered for mere webcam duties; it screams to be used for video conferencing.

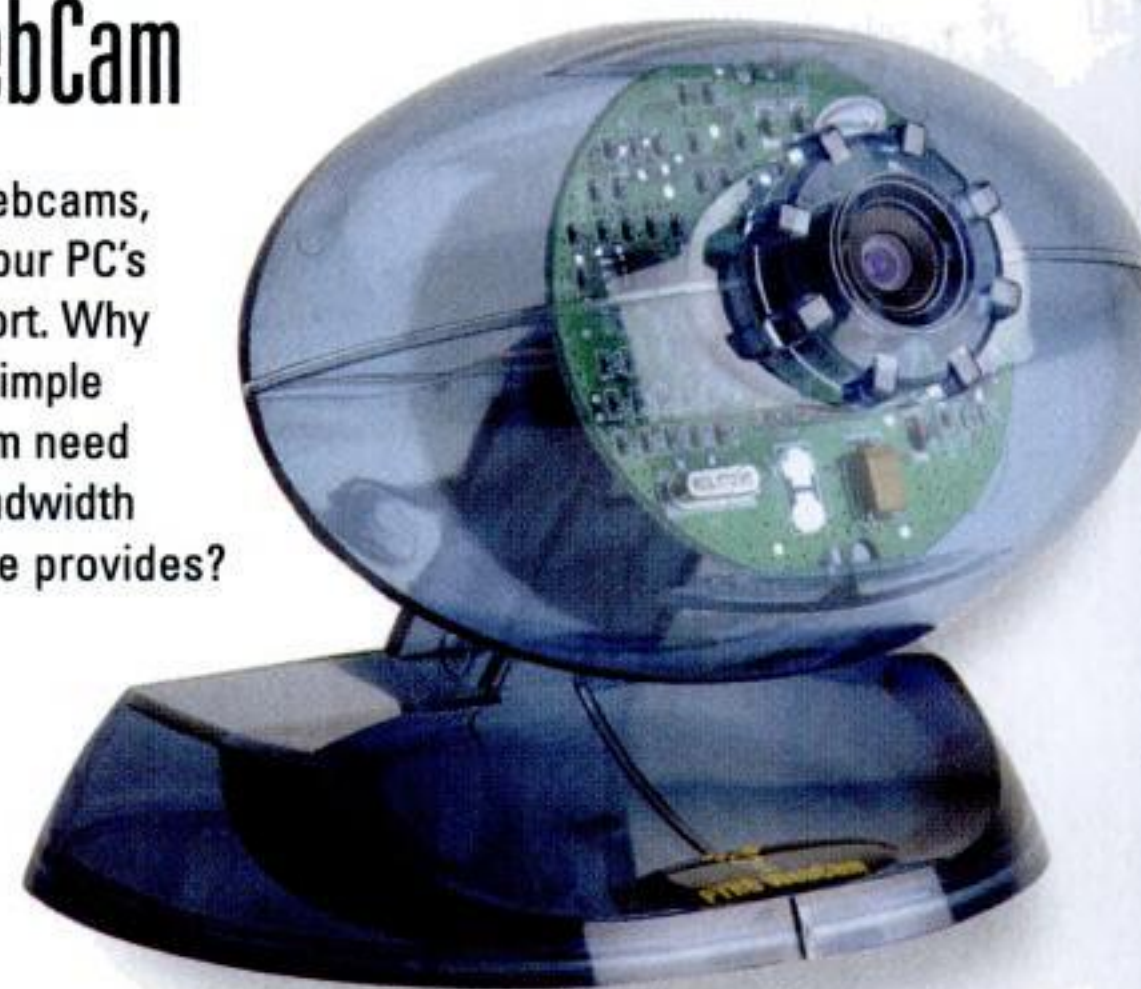
**WHAT WE LIKE:** Big and beautiful images come courtesy of a CCD sensor instead of the webcam-standard, lower-resolution CMOS sensor.

**WHAT WE HATE:** At \$170, it's considerably more expensive than most webcams. And you'll need a FireWire card to use it.

—WILL SMITH

### MAXIMUMPC VERDICT: 10

\$170, Pyro, [www.adstech.com](http://www.adstech.com), 800.888.5244





# Black & White

Spank that monkey!

**A**ny game in which you routinely slap around a giant, tattooed, bipedal cow-god to keep it from leaving Toyota-sized turds all over your temple has something very special going for it. *Black & White* challenges you to ask yourself, "Am I the kind of beneficent god who fulfills his worshippers' nagging demands for homes, wood, and food, or do I prefer seeing how many times I can make them skip across the water?" The beauty of *Black & White* is that it doesn't really pass judgement on the choice you make.

*Black & White* is the culmination of designer Peter Molyneux's long-running obsession with the rigors of being a god, and it echoes his classic creations *Populous*, *Dungeon Keeper*, and even *Magic Carpet*. At its root, *B&W* is very much an old-school Bullfrog game—little people run about the landscape chopping wood, harvesting grain, building structures, and copulating madly while you fend off other gods. The main portion of *B&W* unfolds with only five missions proper, though these are long, multilayered missions. A substantial skirmish mode offers quite a bit more gaming, pitting you against multiple opponents in either solo or multiplayer sessions.

**In Peter Molyneux's *Black & White*, you can be a benevolent god who kindly fulfills your worshippers' needs. Or you can rain fire on all who question your powers.**

You begin your career as a god by choosing your representative on earth from among three giant animals: a cow, a tiger, or an ape. This creature is the heart of the game and is an amazing feat of programming. You teach it how to eat, crap, help people, and cast magic spells through example, reward, and physical punishment. It will grow and develop a unique personality, eventually acting without input. It will also learn to fight, executing combo moves against the creatures of other gods.

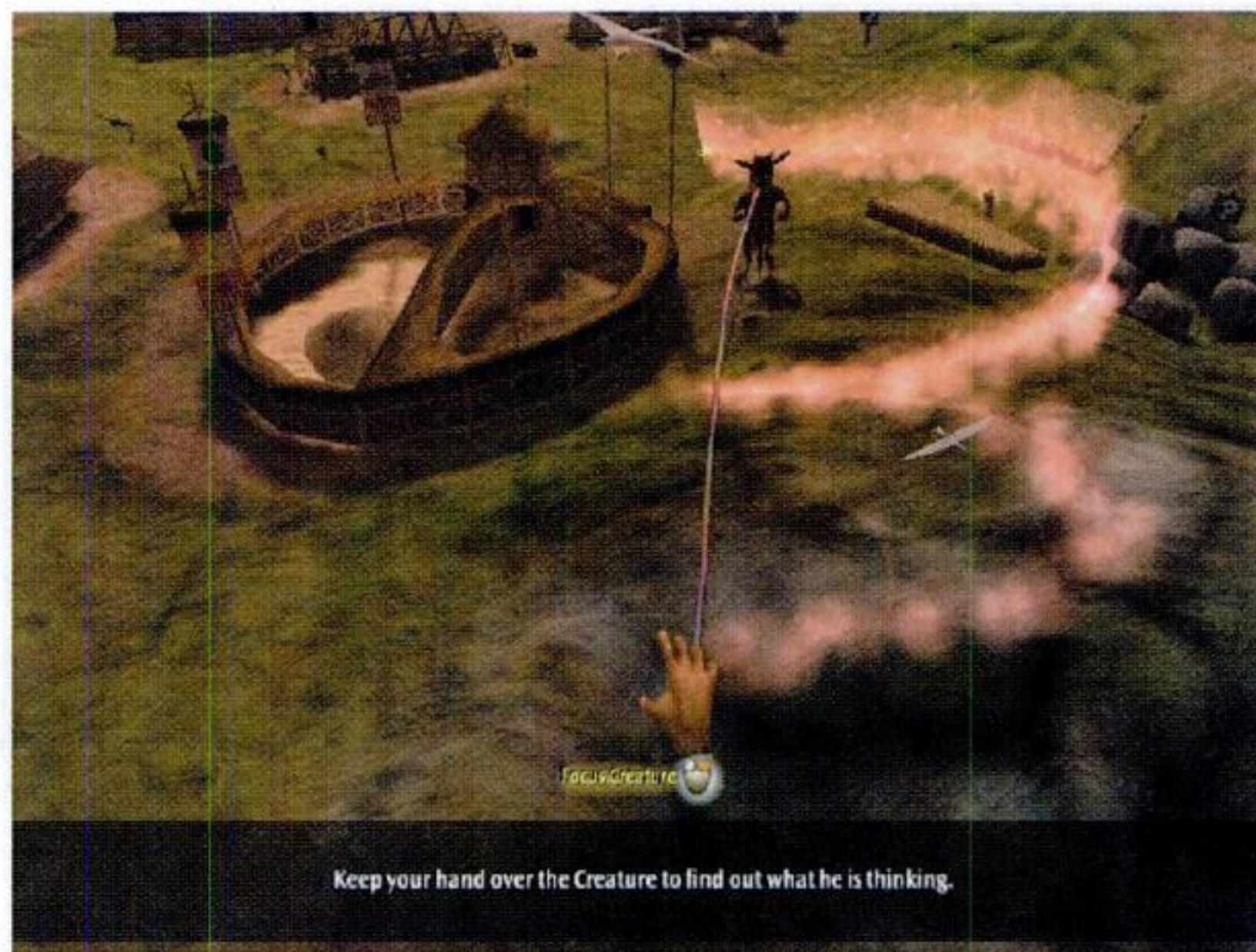
The goal, as with all god games, is to expand your area of power by taking over new villages and creating new

believers. Belief and loyalty—and not happiness—are the keys to victory. Fear can raise belief as much as love, but if you consistently use evil to make people believe, you will become evil and your land will assume a dark, demonic look. You can play the game by managing the needs of your people or by terrorizing them—or by a combination of the two.

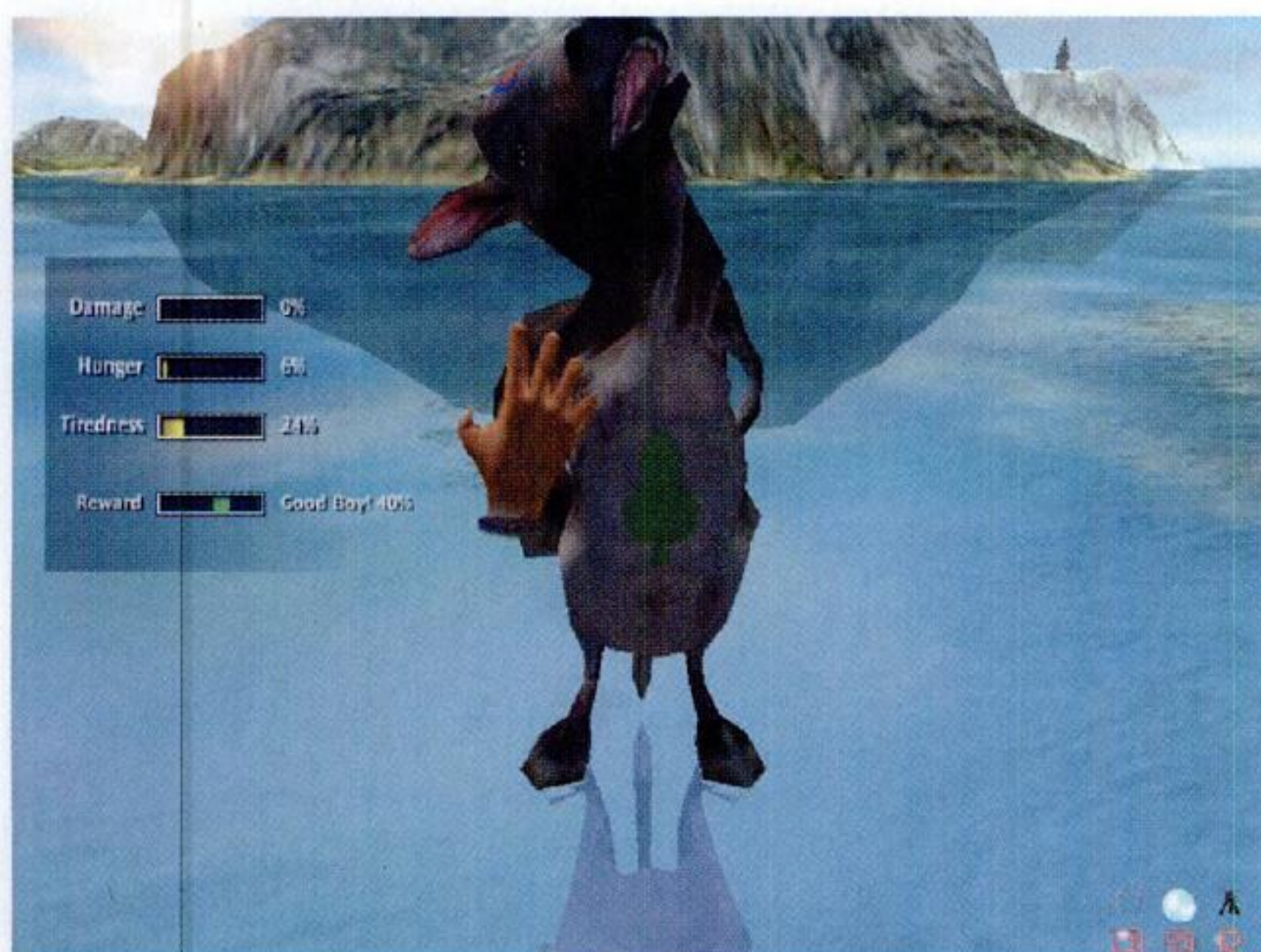
Technologically, this is the state of the art in computer gaming. Gigantic landscapes display hundreds of people and multiple spell effects at once. Transform and lighting effects on the most advanced videocards are pushed to the limit to create a world of rich textures, sublime lighting, and vast scope. If there is difficulty with gameplay, it lies in the camera controls, which are tough to manage by mouse alone. Remapping the camera to the keyboard and a little practice minimizes this challenge by the second mission.

This review barely does justice to the scope, complexity, and sheer joy of *Black & White*. It would take pages to properly explain all of the game's details, from tiny in-game missions and puzzles to custom tattooing of your creature, spell gestures, and the entire creature combat engine. *Black & White* is complex but not complicated—and it's also the most beautiful and unusual game to appear for the PC in many years.

—THOMAS  
MCDONALD



Keep your hand over the Creature to find out what he is thinking.



**The bovine henchman:** As a god, your wishes are conveyed to your believers through an intermediary—a gigantic, tattooed cow, if you so desire.

**MAXIMUMPC VERDICT**

**Black & White**  
EA/LIONHEAD

**+ WHAT WE LIKE**  
Open-ended gameplay, unique intermediary creature, and state-of-the-art graphics.

**- WHAT WE HATE**  
Tough-to-use camera controls, heavy-handed, uh, hand, and steep resource requirements.

PHONE 415 572 9448  
www.eagames.com

**\$40.00**

**10**



# Starfleet Command Vol. II: Empires at War

She needs more power, Captain!

Interplay came perilously close to getting it right with the original *Starfleet Command* a year ago. Using 3D graphics, but set in a two-dimensional universe, the original offered a fresh take on tactical space combat. Not without its flaws, the game was dragged down by flighty AI, a useless campaign system, and sometimes-convoluted commands. *Starfleet Command II* should, in theory, address the flaws, enhance the strengths, and expand the gameplay of the original. It doesn't quite do all that.

The sheer, audacious scope of the *Starfleet Command* design is impressive, since it attempts nothing less than a complete realtime strategic simulation of massive space battles, which play out much like classic naval encounters. Helm, weapon configurations, repairs, transporters, shields, electronic countermeasures and counter-countermeasures, shuttles, other ships, and much more are in the player's control during missions. Since the interface of the original was largely bulletproof, it has been carried over intact to the sequel, providing a large 3D view and a navigable control panel for all stations.

Trading power among speed, weapons, shields, and other systems is an essential element of strategy. This has been slightly streamlined since the last iter-



**The random and confusing Dynaverse II interface makes *Starfleet Command II*'s campaign mode about as illuminating as a black hole.**

ation, and a general, game-wide tweaking of systems performance (e.g., weapons, shields, etc.) has helped greatly to balance out the game. AI has been improved throughout as well. Enemy ships have more tactical finesse, and your own ships tend to follow orders a little more realistically. Overall, most of the changes made to the system have been beneficial. Interplay has stuck with a prestige point system (in which you buy repairs and upgrades using points generated by successful operations), but eliminated the popular crewmember interface that allowed you to "buy" better officers to man your stations.

*Starfleet Command II* retains a disappointing breakdown in two crucial departments: campaign mode and multiplayer. The original campaign mode—based on something dubbed the "Dynaverse" system—was supposed to generate truly dynamic campaigns. Instead, it was little more than a randomization engine, which generated confusion, thanks to poor mission briefings and lackluster mission flow. Little has been done to improve mission briefings and debriefings, often leaving you unable to properly formulate tactics. The campaign system is based on one

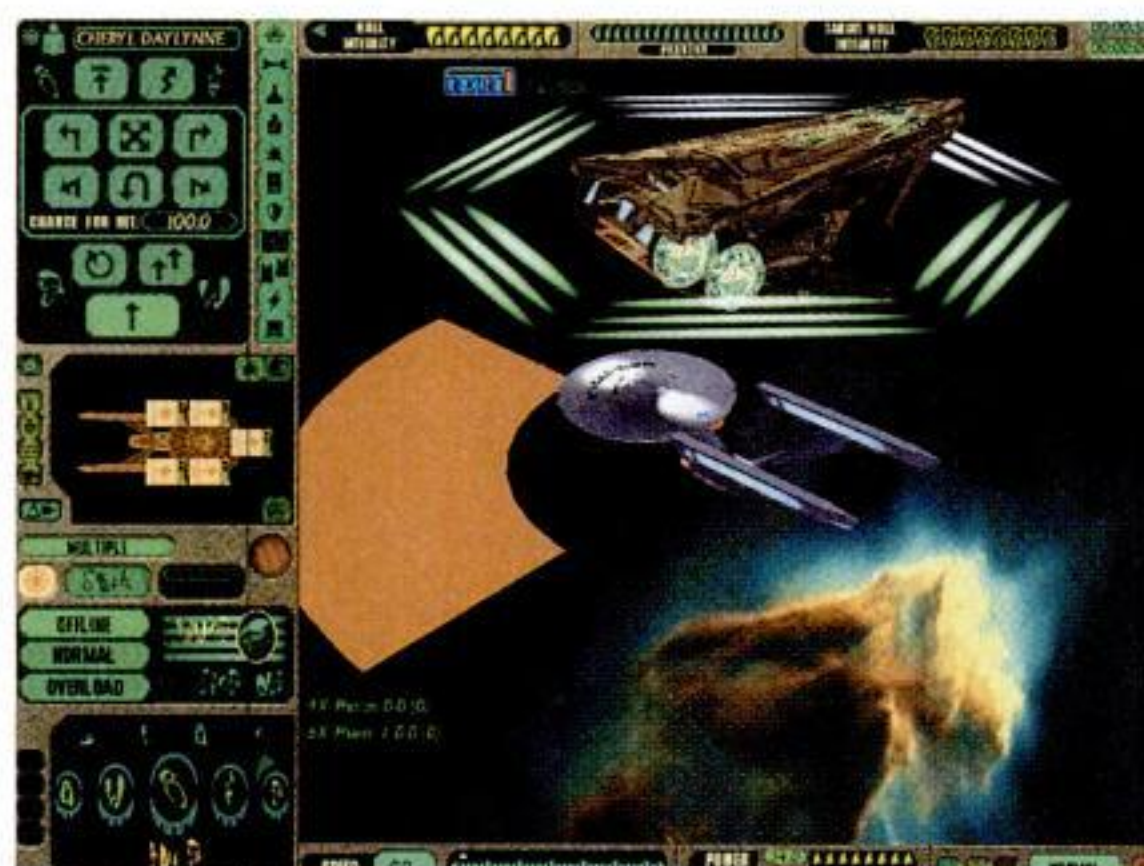
of the most flaccid designs conceivable, utterly failing to immerse the user in the drama of linked battles and gradual progression to bigger and better ships. It creates atmosphere with a confusing array of text boxes and relegates mission selection to a cumbersome sector map.

Worse, the ambitious multiplayer mode based on this Dynaverse engine still hasn't materialized. It was supposed to provide a true, persistent-state *Star Trek* gaming world, but a problem with WON.net at the eleventh hour forced Interplay to ship *Starfleet Command II* without this component.

The graphics and audio production is top-notch, with highly detailed models and full-bodied sound effects. Dozens and dozens of ships are recreated in minute detail, with small firing animations and damage effects. The original races—Federation, Klingon, Romulan, Gorn, Hydran, and Lyran—have been joined by the Mirak and the Interstellar Concordium, and all are playable, which makes for a very diverse gaming experience.

*Starfleet Command* remains a flawed but intriguing RTS game. It's certainly the best tactical game ever done with the Trek license. Though the campaigns don't really measure up, the skirmish mode is terrific and earns the game a recommendation in and of itself. Let's just hope Interplay irons out the multiplayer issues.

—THOMAS MCDONALD



**Smarter skirmishes!** Improvements in *Starfleet Command II*'s AI mean that enemies have sharper tactics and allies do a better job of following orders.

**MAXIMUMPC VERDICT**

**Starfleet Command II**  
INTERPLAY

**+ WHAT WE LIKE**  
Excellent simulation of multi-ship combat and bottomless skirmish options come with great graphics and audio.

**- WHAT WE HATE**  
Weak campaign mode and incomplete multiplayer leaves you unable to formulate tactics.

PHONE 800 468 3775  
www.interplay.com

**\$45.00**

**7**



# Scatter Shots . . .

A seriously hectic shooter trumps two strategy games and an RPG

## Serious Sam: First Encounter

3D shooter *Serious Sam* harks back to the mindless action of *Doom* and *Quake*, but the gameplay comes off more like arcade legends *Robotron 2084* and *Smash TV*. With a tongue-in-cheek attitude reminiscent of *Duke Nukem*, Sam wields an arsenal of destruction against continual waves of monsters. The best news of all? This one is only the *first* encounter.



**WHAT WE LIKE:** *Serious Sam* features an advanced 3D engine equally capable of displaying huge, brightly lit levels and towering monstrosities. Even more amazing, the game casually tosses score upon score of enemies at you from all directions. Multiplayer options let you and a few buddies blast each other or work together against the whole game.

**WHAT WE HATE:** Storyline? Hmm, it's gotta be around here somewhere. Something about how Special Forces veteran Sam Stone time-traveled to ancient Egypt to rid the galaxy of an evil race of immortals. Oops! No time for storyline—gotta shoot more monsters.

—ANDREW S. BUB

### MAXIMUMPC VERDICT: 9

\$19, Gathering of Developers, [www.croteam.com](http://www.croteam.com), 877.403.4263

## Star Trek: Away Team

Beam a cast of Starfleet nobodies into Romulan war zones and Borg compounds, sneak up and right-click the baddies to shoot them dead, and keep outer space free for all peace-loving Federation citizens. Activision was too damn cocky in releasing *Star Trek: Away Team* as a full-priced title. No worries,



though. It shouldn't take long for *Away Team* to hit the jewel-case rack or a three-pack, at which point it will be well worth picking up.

**WHAT WE LIKE:** The first *Trek* RTS allows for either run-and-gun action or, by hitting the pause key, a more methodical approach. Clever vision- and sound-cone features monitor what enemies can see and how much racket your squad makes.

**WHAT WE HATE:** A fixed 640x480 resolution and the lack of inventory management or sharing mar the experience. There's little in the way of technological or design innovation—and with only 18 levels and two difficulty settings, there's little gameplay.

—JASON COMPTON

### MAXIMUMPC VERDICT: 7

\$40, Activision, [www.activision.com](http://www.activision.com), 310.255.2000

## Fallout Tactics: Brotherhood of Steel

Interplay's *Fallout* series is remembered fondly for its solid tactical combat engine and for helping to bring back the RPG genre. This update to the franchise has lots to like. RPG and *Fallout* fans will appreciate the character advancement system, and tactical fans will enjoy the game's maps and combat.



**WHAT WE LIKE:** Players can move through the game with either turn-based or realtime play. The maps and missions offer plenty of inventive and tactically interesting challenges. Characters gain skills and improve their abilities as in a role-playing game.

**WHAT WE HATE:** Enemies lag at completing their actions in turn-based mode. The graphics lag at conveying a sharp sense of atmosphere and scene. There are numerous non-critical bugs. (Interplay has reports on them and says they'll be fixed soon—but you should know that going in.)

—ANDREW S. BUB

### MAXIMUMPC VERDICT: 7

\$49, Interplay, [www.interplay.com](http://www.interplay.com), 949.553.6678

## Fate of the Dragon

*Fate of the Dragon* takes RTS to ancient China as three warlords struggle for power during the fall of the Han dynasty. Players wield the sword of any one of the three leaders and oversee a vast empire-in-the-making. Ultimately, only Chinese faces and bad voice-overs distinguish *Fate of the Dragon* from run-of-the-mill RTS games.



**WHAT WE LIKE:** More of a strategic game than the RTS trappings imply, *Fate of the Dragon* provides an intuitive mini-map feature for managing cities and towns. The game also believably executes supply lines—players have to turn raw materials into usable food, then strap it onto wagons and distribute it to troops on the front lines.

**WHAT WE HATE:** AI isn't up to par; enemy troops have a disconcerting habit of rushing cities, completely forgetting about siege equipment. Mass troop movements and combat are an exercise in chaos and frustration because *Fate of the Dragon* doesn't allow grouping of troops into formations.

—BILL MCCLENDON

### MAXIMUMPC VERDICT: 7

\$40, Eidos, [www.eidosinteractive.com](http://www.eidosinteractive.com), 415.547.1244



# EVOLVE



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Speaker & Subwoofer System  
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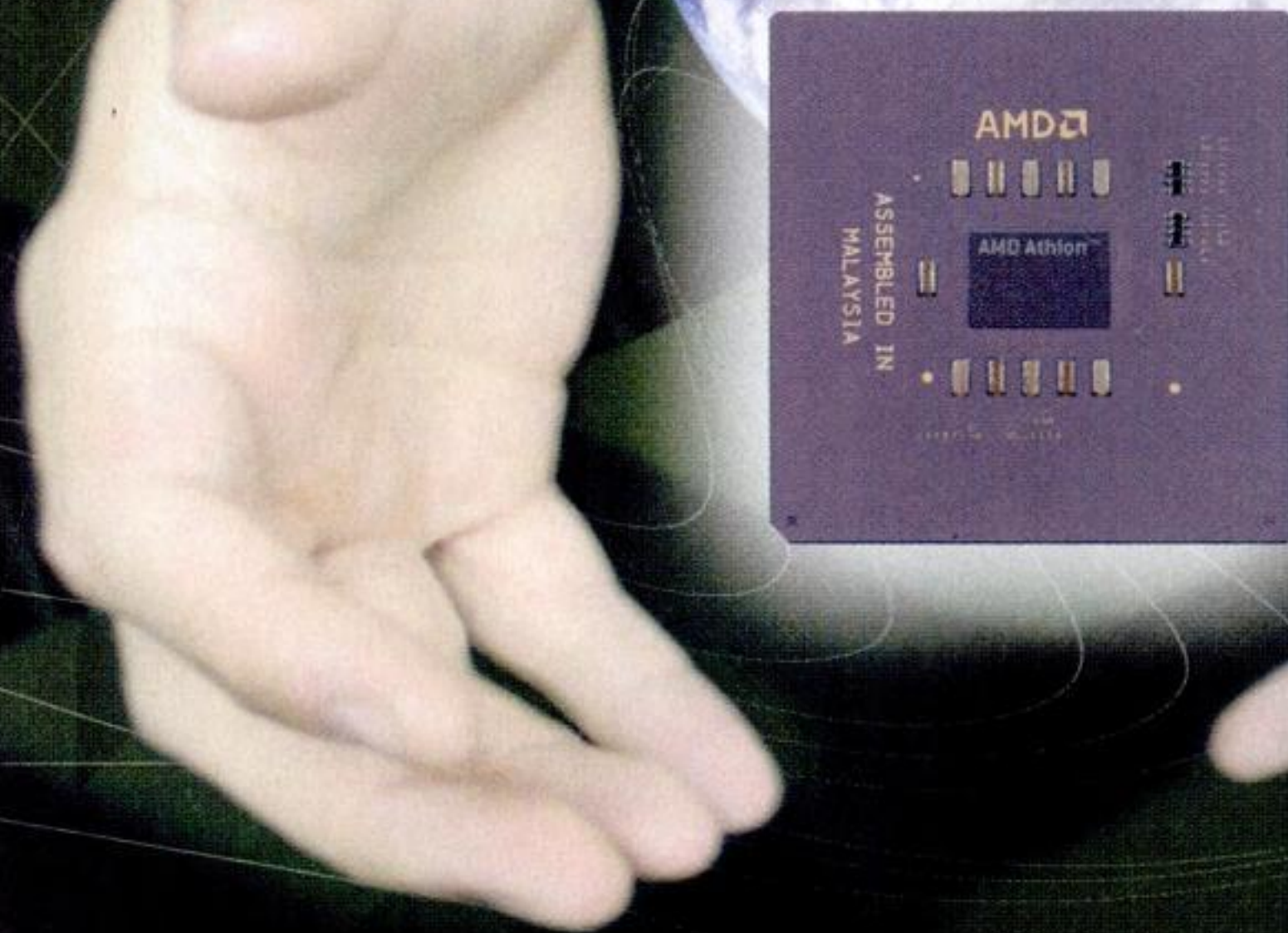


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| 1.2Ghz '266'             | \$179.00 |
| 1.2Ghz '200'             | \$169.00 |
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| 1.0Ghz                   | \$187.00 |
| 950Mhz                   | \$146.00 |
| 900Mhz                   | \$111.00 |
| 850Mhz                   | \$93.00  |

|               |         |
|---------------|---------|
| <b>DURON</b>  |         |
| 900Mhz Athlon | \$94.00 |
| 850Mhz Athlon | \$94.00 |
| 800Mhz Athlon | \$94.00 |

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|-----------------|----------|
| <b>INTEL P4</b> |          |
| 1.5Ghz '400'    | \$418.00 |
| 1.4Ghz '400'    | \$80.00  |
| 1.3Ghz '400'    | \$61.00  |

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|-----------------------|----------|
| <b>INTEL PIII OEM</b> |          |
| PGA 256k "Flip Chip"  |          |
| 1Ghz PC133            | \$179.00 |
| 933Mhz PC133          | \$169.00 |

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|--------------------------|---------|
| <b>INTEL CELERON OEM</b> |         |
| FPGA 128k "Flip Chip"    |         |
| 766Mhz                   | \$80.00 |
| 733Mhz                   | \$78.00 |

## Monitors

|                 |          |
|-----------------|----------|
| <b>KDS</b>      |          |
| 17" Digital .27 | \$169.00 |
| 17" Digital .24 | \$227.00 |
| 19" Digital .26 | \$277.00 |

## Memory

|                           |          |
|---------------------------|----------|
| <b>184 PIN DDR PC2100</b> |          |
| 128MB 266Mhz              | \$74.00  |
| 256MB 266Mhz              | \$154.00 |

|                            |         |
|----------------------------|---------|
| <b>168 PIN SDRAM PC133</b> |         |
| 64MB SDRAM                 | \$25.00 |
| 128MB SDRAM                | \$52.00 |
| 256MB SDRAM                | \$93.00 |

|                       |          |
|-----------------------|----------|
| <b>168 PIN RAMBUS</b> |          |
| 128MB 800Mhz          | \$141.00 |
| 256MB 800Mhz          | \$277.00 |

## Hard Drives



|                        |          |
|------------------------|----------|
| <b>WESTERN DIGITAL</b> |          |
| 10.0GB 100/5400RPM     | \$74.00  |
| 20.0GB 100/7200RPM     | \$98.00  |
| 30.7GB 66/5400RPM      | \$96.00  |
| 30.0GB 100/7200RPM     | \$122.00 |

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|------------------|----------|
| <b>IBM</b>       |          |
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## Sound Cards

|               |         |
|---------------|---------|
| Yamaha PCI    | \$22.00 |
| Diamond MX400 | \$46.00 |

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|----------------------|---------|
| <b>CREATIVE LABS</b> |         |
| PCI 16 Audio PCI     | \$22.00 |
| PCI 128 Audio PCI    | \$33.00 |
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| Intel PRO 10/100 OEM   | \$41.00 |
| 3COM 10/100 PCI        | \$44.00 |
| DSL/Cable Modem Router | \$96.00 |

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|---------------------|----------|
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| Radeon 32MB DDR AGP | \$79.00  |
| Radeon 64MB DDR AGP | \$242.00 |

|                    |         |
|--------------------|---------|
| <b>NVIDIA TNT2</b> |         |
| M64 16MB AGP DVD   | \$48.00 |
| M64 32MB AGP DVD   | \$62.00 |

|                                  |          |
|----------------------------------|----------|
| <b>MATROX Millenium G450 DDR</b> |          |
| 16MB AGP DVD                     | \$79.00  |
| 32MB AGP DVD                     | \$103.00 |

## Motherboards

|                        |          |
|------------------------|----------|
| <b>AMD Athlon</b>      |          |
| Biostar M7VKB 2.0      | \$92.00  |
| Microstar MS-K7TPRO2-A | \$118.00 |
| MSI DUAL 370 MS6321    | \$138.00 |
| Asus A7V PC133         | \$149.00 |
| Asus A7A266A DDR       | \$179.00 |

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|-----------------------------|----------|
| <b>Intel</b>                |          |
| Intel 815EA w/video & sound | \$133.00 |
| Biostar M6VCG               | \$77.00  |
| Asus CUV4X                  | \$98.00  |

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|------------------|----------|
| <b>CDRW</b>      |          |
| Toshiba 4X4X24X  | \$199.00 |
| TEAC 12X10X32X   | \$166.00 |
| Yamaha 16X10X40X | \$236.00 |

|               |         |
|---------------|---------|
| <b>CD Rom</b> |         |
| Mitsumi 48x   | \$38.00 |
| ASUS 50x      | \$44.00 |

## Modems

|                            |         |
|----------------------------|---------|
| Voice/Fax Hardware ISA     | \$34.00 |
| Voice/Fax Full Duplex PCI  | \$32.00 |
| V.90 PCI w/ Voice Lucent   | \$15.00 |
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- ▶ 32MB DDR SDRAM Nvidia Geforce2 GTS Graphics Accelerator
- ▶ Creative Labs Sound Blaster Live!Value Sound Card
- ▶ Creative Labs Cambridge PCWorks Fourpoint Surround FPS1000 Speaker/Subwoofer
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- ▶ 32MB Nvidia Geforce2 MX 200 Graphics Accelerator
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- ▶ Microsoft Mouse
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| AMD T-Bird 900MHz Processor w/ Chaintech 7AIV-100 Motherboard, 128MB SDRAM and AMD Recommended Cooling Fan .....                        | \$ 265 |
| AMD T-Bird 1GHz Processor w/ Chaintech 7AJA-100 Motherboard, 128MB SDRAM and AMD Recommended Cooling Fan .....                          | \$ 290 |
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| Chaintech 7KJD<br>AMD 761 DDR .....                  | \$ 140 |
| Microstar KLE133<br>VIA KLE133 .....                 | \$ 70  |
| Microstar K7T Turbo<br>VIA KT133 (FSB 200/266) ..... | \$ 103 |
| Microstar K7T266 Pro<br>VIA DDR.....                 | \$ 145 |

### Socket 370 Intel

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|-----------------------------------------|-------|
| Microstar 6337 LE<br>Intel 815 EP ..... | \$ 88 |
|-----------------------------------------|-------|

## MEMORY

### 168 Pin SDRAM PC133

|                   |        |
|-------------------|--------|
| 64MB SDRAM.....   | \$ 28  |
| 128MB SDRAM ..... | \$ 55  |
| 256MB SDRAM ..... | \$ 105 |

### PC2100 DDR

|                 |       |
|-----------------|-------|
| 128MB DDR ..... | \$ 80 |
|-----------------|-------|

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### Seagate

|                        |        |
|------------------------|--------|
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| 40GB 100/5400RPM ..... | \$ 118 |
| 40GB 100/7200RPM ..... | \$ 145 |
| 60GB 100/7200RPM ..... | \$ 225 |

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| Creative Labs Sound Blaster<br>16Bit PCI .....           | \$ 20 |
| Creative Labs Sound Blaster<br>Live Value PCI .....      | \$ 49 |

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| Diamond Multimedia<br>Supra Max PCI V.90 Voice Conexant .. | \$ 26 |
| 3Com/US Robotics<br>2977 PCI V.90 .....                    | \$ 48 |
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| ATI Radeon VE 32MB DDR AGP .....                             | \$ 98  |
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| Teac 12X10X32 .....     | \$ 150 |

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| Toshiba 16X..... | \$ 80 |

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| 3 Com 8-Port 10/100M<br>OfficeConnect Daul Speed ..... | \$150 |

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| <b>Intel Pentium III 866 \$ 609</b> |        | M6033 |
| Intel Pentium III 850               | \$ 605 | M6034 |
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### CYBERPOWER INC.

Product Guide

AMD THUNDERBIRD/DURON CUSTOM BUILD SYSTEM  
Availability Usually ships in 1-2 weeks.

SUBTOTAL: 671.00

**CPU** AMD DURON 800MHZ CPU (+89)

**MOTHERBOARD** EPOX 8KTA VIA-KT133 THOUNDERBIRD MOTHERBOARD (+105)  
If system board has a "" means it has AC-97 stereo sound on board but you still can choose a higher level sound card to be installed.

**MEMORY** 64MB SDRAM PC1133 (+45)

**HARD DRIVE** 20GB 5400 RPM UDMA 66 HARD DRIVE (+115)

### AMD BEST BUY

- VIA KT133A 266 MHZ FSB 4X AGP MAIN BOARD
- 128 MB PC133 SDRAM
- 40 GB Ultra DMA 100 Hard Drive
- NVIDIA TNT2 M64 32MB 3D AGP Video Card
- 52X CD-ROM
- AC97 3D Wavetable Sound Card
- 120-Watt Power Stereo Speakers
- ZOOM PCI 56K V.90 Fax Modem w/ Voice
- Mitsumi 1.44 MB Floppy Drive
- 108 KEY Win98 Keyboard & Internet Mouse
- Medium Tower Case w/ 250 Watt UL
- Microsoft Windows Millennium or 98 2nd Edition
- Corel Wordperfect Office 2000
- 17" .27MM SVGA Monitor +\$165
- One Year On Site Service +\$29

|                    |        |       |
|--------------------|--------|-------|
| AMD ATHLON 1.4GHZ  | \$ 735 | ME601 |
| AMD ATHLON 1.33GHZ | \$ 689 | ME602 |
| AMD ATHLON 1.2GHZ  | \$ 665 | ME603 |
| AMD ATHLON 1.13GHZ | \$ 639 | ME604 |
| AMD ATHLON 1.0GHZ  | \$ 619 | ME605 |
| AMD ATHLON 900     | \$ 599 | ME606 |
| AMD DURON 850      | \$ 549 | ME607 |
| AMD DURON 800      | \$ 529 | ME608 |

### ATHLON LIGHTNING DVD

- VIA KT133A 266 MHZ FSB 4X AGP MAIN BOARD
- 256 MB PC133 SDRAM
- 40 GB Ultra DMA 100 RPM Hard Drive
- NVIDIA GeForce-2 MX 32MB 4X AGP Video Card
- 12X DVD-ROM
- 8X4X32 CDRW Drive
- AC97 3D Wavetable Sound Card
- ALTEC LANSING ACS 651 Subwoofer System
- 19" .26MM SVGA Monitor
- ZOOM 56K V.90 Fax Modem w/ Voice
- Mitsumi 1.44 MB Floppy Drive
- PS2 Win98 Keyboard & Internet Mouse
- ATX Medium Tower Case w/ 300 Watt UL
- Microsoft Windows Millennium or 98 2nd Edition
- Corel Wordperfect Office 2000
- One Year On Site Service +\$29

|                    |         |       |
|--------------------|---------|-------|
| AMD ATHLON 1.4GHZ  | \$ 1149 | MH601 |
| AMD ATHLON 1.33GHZ | \$ 1109 | MH602 |
| AMD ATHLON 1.2GHZ  | \$ 1079 | MH603 |
| AMD ATHLON 1.13GHZ | \$ 1055 | MH604 |
| AMD ATHLON 1.0GHZ  | \$ 1039 | MH605 |
| AMD ATHLON 900     | \$ 1015 | MH606 |
| AMD DURON 850      | \$ 965  | MH607 |
| AMD DURON 800      | \$ 945  | MH608 |

### ATHLON BEST BUY

- VIA KT133A 266 MHZ FSB 4X AGP MAIN BOARD
- 128 MB PC133 SDRAM
- 40 GB Ultra DMA 100 Hard Drive
- NVIDIA GeForce-2 MX 32MB 4X AGP Video Card
- 12X DVD-ROM
- AC97 3D Wavetable Sound Card
- 240-Watt Power Stereo Speakers System
- ZOOM 56K V.90 Fax Modem w/ Voice
- Mitsumi 1.44 MB Floppy Drive
- PS2 Win98 Keyboard & Internet Mouse
- ATX Medium Tower Case w/ 250 Watt UL
- Microsoft Windows Millennium or 98 2nd Edition
- Corel Wordperfect Office 2000
- 19" .26MM SVGA Monitor +\$235
- One Year On Site Service +\$29

|                    |        |       |
|--------------------|--------|-------|
| AMD ATHLON 1.4GHZ  | \$ 799 | MJ601 |
| AMD ATHLON 1.33GHZ | \$ 755 | MJ602 |
| AMD ATHLON 1.2GHZ  | \$ 729 | MJ603 |
| AMD ATHLON 1.13GHZ | \$ 699 | MJ604 |
| AMD ATHLON 1.0GHZ  | \$ 685 | MJ605 |
| AMD ATHLON 900     | \$ 665 | MJ606 |
| AMD DURON 850      | \$ 615 | MJ607 |
| AMD DURON 800      | \$ 595 | MJ608 |

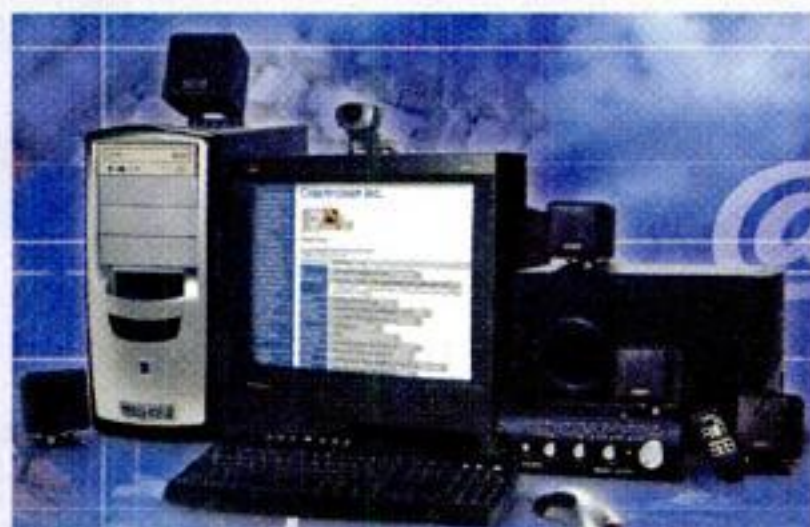
### GAMER XTREME 850



- AMD 761 266MHZ FSB DDR MAIN BOARD
- 256 MB PC266 SDRAM
- 60 GB Ultra DMA 100 Hard Drive
- ATI RADEON VE 32MB DDR W/ DUAL MONITOR OUTPUT AGP Video Card
- 16X DVD-ROM
- CREATIVE LAB SOUND BLASTER LIVE VALUE
- ALTEC LANSING ACS 54 Subwoofer System
- 19" VIEWSONIC E790 .22MM SVGA Monitor
- ZOOM 56K V.90 Fax Modem
- Mitsumi 1.44 MB Floppy Drive
- PS2 Win98 Multimedia Keyboard
- PS2 Internet Mouse w/ Wheel
- ATX Medium Tower Case w/ 300 Watt UL
- Microsoft Windows Millennium or 98 2nd Edition
- COREL WORDPERFECT OFFICE 2000
- Free One Year On Site Service

|                    |         |       |
|--------------------|---------|-------|
| AMD ATHLON 1.4GHZ  | \$ 1399 | ML601 |
| AMD ATHLON 1.33GHZ | \$ 1359 | ML602 |
| AMD ATHLON 1.2GHZ  | \$ 1329 | ML603 |
| AMD ATHLON 1.13GHZ | \$ 1305 | ML604 |
| AMD ATHLON 1GHZ    | \$ 1289 | ML605 |
| AMD ATHLON 900     | \$ 1269 | ML606 |

### PC THEATER BESTBUY



- VIA KT-133A 266MHZ FSB 4X AGP MAIN BOARD
- 128 MB PC133 SDRAM
- 40 GB Ultra DMA 100 Hard Drive
- ATI Radeon VE 32MB DDR Dual Monitor Output Video Card
- 16X DVD-ROM
- Creative Lab Sound Blaster Live Value 5.1
- Creative cambridge SoundWorks Desk Top Theater 5.1 DTT2200 Surround Sound System
- PCI 56K V.90 Fax Modem
- Black 1.44 MB Floppy Drive
- Black PS2 Internet Keyboard
- Black PS2 Internet Mouse w/ Wheel

- Black Stylish ATX Medium Tower Case 300 Watt UL
- Microsoft Windows Millennium or 98 2nd Edition
- Corel Wordperfect Office 2000
- Optional Black 19" .26 MM SVGA +\$335
- One Year On Site Service +\$29

|                    |        |       |
|--------------------|--------|-------|
| AMD ATHLON 1.4GHZ  | \$ 929 | M6011 |
| AMD ATHLON 1.33GHZ | \$ 889 | M6012 |
| AMD ATHLON 1.2GHZ  | \$ 865 | M6013 |
| AMD ATHLON 1.13GHZ | \$ 835 | M6014 |
| AMD ATHLON 1.0GHZ  | \$ 819 | M6015 |
| AMD ATHLON 900 MHZ | \$ 799 | M6016 |
| AMD DURON 900      | \$ 769 | M6017 |

### HOME ENTERTAINMENT

(www.cyberpowerpc.com/cyberpower/homeenter.html)

- 128 MB PC133 SDRAM
- 40 GB Ultra DMA 66 Hard Drive
- ATI EXPERT 98 8MB AGP Video Card
- 52X CD-ROM
- AC97 3D Wavetable Sound Card
- 120-Watt Power Stereo Speakers
- ZOOM 56K V.90 Fax Modem w/ Voice
- Mitsumi 1.44 MB Floppy Drive
- Windows 98 Keyboard & Internet Mouse
- Medium Tower Case
- One Year On Site Service +\$29

|                    |        |       |
|--------------------|--------|-------|
| AMD ATHLON 1.3 GHZ | \$ 575 | M6061 |
| AMD ATHLON 1.2 GHZ | \$ 550 | M6062 |
| AMD ATHLON 1.1 GHZ | \$ 525 | M6063 |
| AMD ATHLON 900     | \$ 485 | M6064 |
| AMD DURON 850      | \$ 435 | M6065 |
| AMD DURON 800      | \$ 415 | M6066 |



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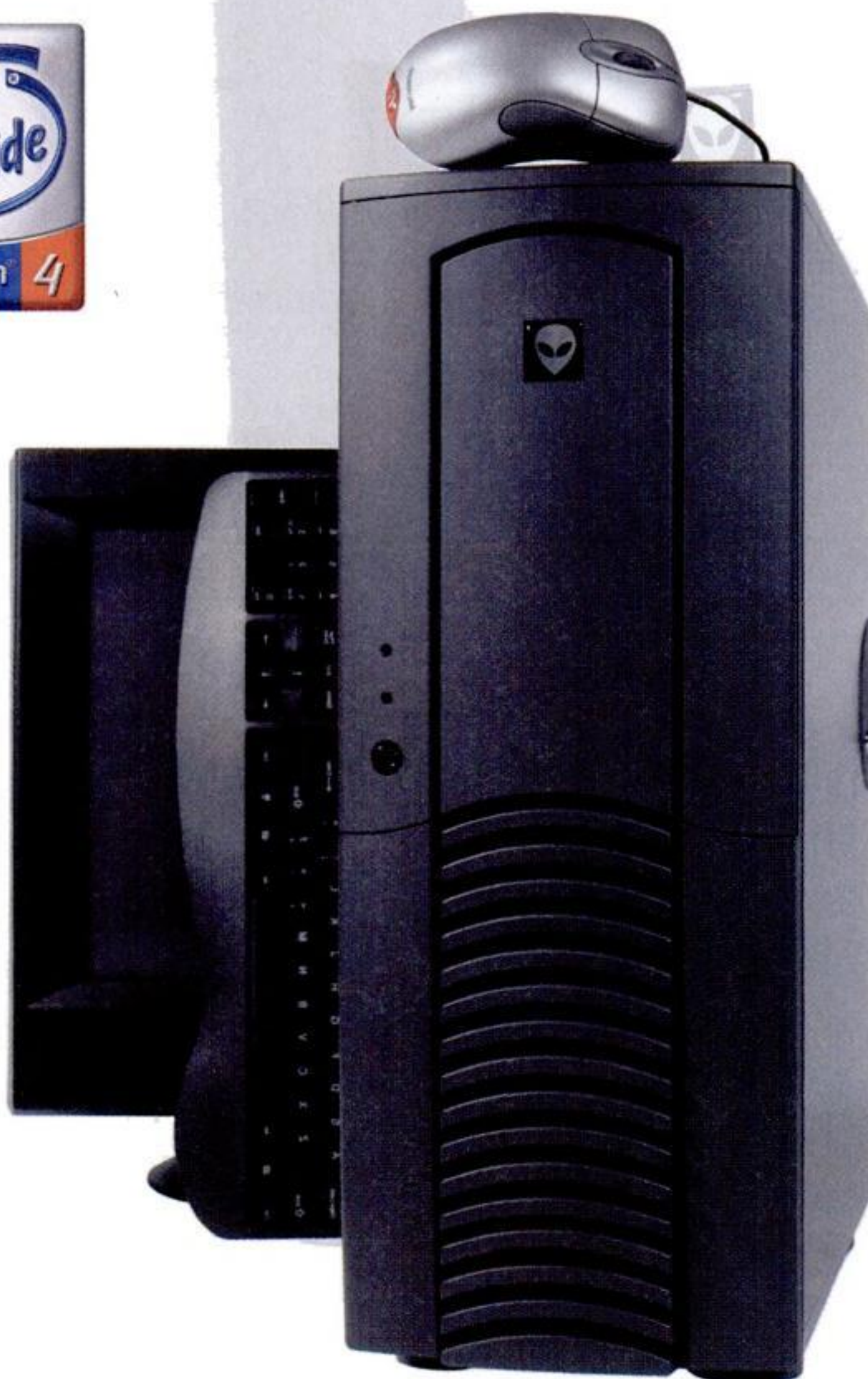


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|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99  | 100 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |     |

| Case Specification & Price List                                |           |                     |            |                   |                  |           |
|----------------------------------------------------------------|-----------|---------------------|------------|-------------------|------------------|-----------|
| Model                                                          | Price     | Dimension<br>W.D.H. | MB<br>Size | 5.25<br>Ext./Int. | 3.5<br>Ext./Int. | P.S.      |
| R02 BAPE                                                       | 300       | 19x17.6x3.5         | M ATX      | 1/0               | 1/1              | 150W      |
| R04 BW                                                         | 290       | 19x24.3x3.5         | ATX        | 1/0               | 1/1              | 250W      |
| R08 BW                                                         | 1675/2300 | 19x22x3.5           |            |                   |                  |           |
| R12 BW                                                         | 305       | 19x19.7x7           | B/ATX      | 4/0               | 1/0              | 250W      |
| R14 BW                                                         | 230       | 19x21x7             | B/ATX      | 3/0               | 1/3              | 300W      |
| R15                                                            | 325/550   | 19x24.4x7           | ATX        | 6/0               | 2/2              | 300W      |
| R16 BW                                                         | 240       | 19x18x7             | B/ATX      | 3/0               | 1/2              | 250W      |
| R20 BW                                                         | 290       | 19x20.5x7           |            | 8/0               | 3/0              | 300W      |
| R21 BW                                                         | 290       | 19x18x7             |            | 8/0               | 3/0              | 300W      |
| R22 RB/W                                                       | 635/950   | 19x23.3x10.5        | ATX        | 8/0               | 1/0              | 300W/R    |
| R26 RB/W                                                       | 630/850   | 19x22.6x10.7        | ATX        | 4/0               | 2/4              | 300W/R    |
| R28                                                            | 290       | 19x17x8.7           | ATX        | 4/0               | 2/4              | 300W      |
| RSP                                                            | 18        | 5.89x3x1.6          |            |                   | 1                |           |
| FSM169                                                         | 65/75     | 10x11.5x3.3         |            |                   |                  |           |
| 001B                                                           | 75        | 8.3x10.6x2.8        |            | 1/0               |                  | 60W       |
| 001B1                                                          | 65        | 8.3x10.6x2.8        |            | 1/0               |                  | 50W       |
| 002B                                                           | 88        | 6.9x14.6x5.8        |            | 2/0               |                  | 60W       |
| 002B1                                                          | 78        | 7.5x11.2x6.5        |            | 2/0               |                  | 80W       |
| 004B                                                           | 105       | 6.8x15.3x9.3        |            | 4/0               |                  | 230W      |
| 004B1                                                          | 100       | 7.5x17.3x10.2       |            | 4/0               |                  | 200W      |
| 007B                                                           | 180       | 7x15.8x13           |            | 7/0               |                  | 250W      |
| 008B                                                           | 280       | 8.4x20.2x18.3       |            | 8/0               |                  | 300W      |
| 008B1                                                          | 180       | 7.5x17.9x17.1       |            | 8/0               |                  | 250W      |
| 103LPX                                                         | 330       | 12.4x14.5x3.4       | LPX        | 1/0               | 1/1              | 85W       |
| 104NLX                                                         | 460       | 12.4x14.5x3.4       | NLX        | 1/0               | 1/1              | 85W       |
| 105LPX                                                         | 375       | 11.9x12.6x3.3       | LPX        | 1/0               | 1/1              | 90W       |
| 106LPX-7                                                       | 260       | 12.4x14.5x3.4       | LPX        | 1/0               | 1/1              | 85W       |
| 108NLX bare                                                    | 375       | 11x13.6x3.4         | NLX        | 1/0               | 1/1              | 135W      |
| 192M ATX                                                       | 85        | 13.1x16.5x3.5       | M ATX      | 1/0               | 1/1              | 150W      |
| 224                                                            | 75        | 17.4x18.8x6.1       | ATX        | 3/0               | 2/2              | 230W      |
| 267                                                            | 75        | 16.8x16.8x6.2       | ATX        | 2/0               | 2/1              | 250W      |
| 271                                                            | 90        | 17.5x15.9x5.5       | ATX        | 2/0               | 1/1              | 250XB     |
| 288                                                            | 75        | 16.9x17x6           | ATX        | 3/0               | 2/1              | 230W      |
| 325B                                                           | 75        | 8x18.5x17           | ATX        | 3/0               | 2/1              | 235W      |
| 327                                                            | 72        | 7.5x16.5x17.3       | ATX        | 3/0               | 2/2              | 230W      |
| 337                                                            | 88        | 7.8x18.8x16.5       | ATX        | 3/0               | 2/2              | 300W      |
| 338                                                            | 55        | 7x14.7x13.8         | M ATX      | 2/0               | 2/1              | 145W      |
| 366                                                            | 55        | 7.2x15.5x14.3       | M ATX      | 2/0               | 2/1              | 235W      |
| 367                                                            | 50        | 7x16.5x16.7         | ATX        | 3/0               | 2/1              | 235W      |
| 370                                                            | 89        | 8.3x17.5x17.1       | ATX        | 3/0               | 2/2              | 250WB     |
| 392                                                            | 80        | 7.5x17x17.5         | ATX        | 6/0               | 1/1              | 250W      |
| 393                                                            | 95        | 9x17.5x17.5         | ATX        | 6/0               | 1/1              | 250W      |
| 396                                                            | 55        | 8.3x17x15.5         | ATX        | 3/0               | 1/3              | 230W      |
| 401                                                            | 110       | 8.5x17.3x18         | ATX        | 2/0               | 2/2              | 250W      |
| 408                                                            | 80        | 8.2x19.8x18.4       | ATX        | 3/0               | 1/5              | 250W      |
| 411                                                            | 62        | 7.2x17.2x16.8       | ATX        | 4/0               | 2/1              | 250W      |
| 412                                                            | 62        | 7.2x17.2x16.8       | ATX        | 4/0               | 1/2              | 250W      |
| 413/BL                                                         | 62        | 8.5x19.5x18         | ATX        | 4/0               | 2/1              | 250W      |
| 414P                                                           | 62        | 7.2x20x16.8         | ATX        | 4/0               | 2/1              | 250W      |
| 422                                                            | 70        | 7.7x16.6x18.1       | AT         | 4/0               | 1/4              | 250W      |
| 424                                                            | 80        | 7.5x17.5x19.3       | ATX        | 4/0               | 2/1              | 250W      |
| 426B W/S                                                       | 70        | 7.5x17.5x19.3       | ATX        | 3/0               | 2/2              | 250W      |
| 436                                                            | 70/85     | 8.6x18x15.6         | ATX        | 3/0               | 2/2              | 250/300W  |
| 455                                                            | 110       | 8.5x17.5x18.6       | ATX        | 4/0               | 2/3              | 250W      |
| 465                                                            | 195       | 9.3x17x17.2         | XEONATX    | 2/0               | 2/4              | 250W/300W |
| 467                                                            | 85/100    | 7.5x16.7x18.8       | ATX        | 3/0               | 2/4              | 250W/300W |
| 470                                                            | 110       | 8.3x17.3x21.3       | ATX        | 4/1               | 1/2              | 250WB     |
| 472                                                            | 60        | 7.5x18x17.6         | ATX        | 4/0               | 2/2              | 250W      |
| 482B                                                           | 80        | 7.8x19.8x17.5       | ATX        | 4/0               | 2/1              | 250W      |
| 486                                                            | 67        | 9.6x19.5x17         | ATX        | 4/0               | 2/1              | 250W      |
| 489**                                                          | 85        | 7.3x17x17           | ATX        | 3/0               | 1/2              | 235W      |
| 490                                                            | 70        | 8.5x15.5x15         | ATX        | 2/0               | 2/2              | 250W      |
| 491B                                                           | 70        | 8.5x15.5x15         | ATX        | 2/0               | 2/2              | 250W      |
| 496                                                            | 60        | 8.2x17.6x16.5       | ATX        | 4/0               | 2/3              | 230W      |
| 501                                                            | 185       | 8.2x17.6x23.8       | ATX        | 4/0               | 2/4              | 300W      |
| 503RB                                                          | 455       | 14.8x20.4x18.4      | ATX        | 8/0               | 2/4              | 300W/R    |
| 503RB                                                          | 305       | 14.8x20.4x18.4      | ATX        | 8/0               | 2/4              | 300W      |
| 505                                                            | 510       | 14.6x23x26.8        | ATX        | 12/0              | 1/8              | 300W      |
| 505R                                                           | 505       | 14.6x23x26.8        | ATX        | 12/0              | 1/8              | 300W/R    |
| 505R                                                           | 155/370   | 13.9x25.6x19.1      | ATX        | 6/0               | 2/2              | 300W/R    |
| 506R                                                           | 380       | 7.8x16.5x24.4       | ATX        | 7/0               | 1/2              | 300W/R    |
| 524                                                            | 105/120   | 7.5x17.5x24.5       | ATX        | 6/0               | 1/5              | 250W/300W |
| 526BW                                                          | 95/110    | 7.5x16.5x24.8       | ATX        | 6/0               | 1/5              | 250W/300W |
| 528                                                            | 93/108    | 7.8x17x24           | ATX        | 5/0               | 1/6              | 300W/R    |
| 536                                                            | 290       | 8x20.5x24.5         | ATX        | 5/0               | 1/6              | 300W      |
| 555/R                                                          | 440/680   | 11x19.3x23.6        | F          | 4/8               | 0/0              | 400W/300R |
| 555/R                                                          | 440/700   | 11x19.3x23.6        | ATX        | 4/8               | 0/0              | 400W/300R |
| 560/R                                                          | 290/445   | 15x24.5x23.5        | ATX        | 11/0              | 2/4              | 300W/300R |
| 562/R                                                          | 250/470   | 8.7x17.9x26.8       | ATX        | 9/1               | 1/0              | 300W/300R |
| 563/RBW                                                        | 145/370   | 8.7x17.9x26.8       | ATX        | 10/0              | 3/0              | 300W/300R |
| 565                                                            | 195       | 9.25x18.3x21.2      | XEONATX    | 4/0               | 2/4              | 300W      |
| 568                                                            | 105/120   | 7.5x17x22.8         | ATX        | 5/0               | 2/4              | 250W/300W |
| 568BW                                                          | 225       | 13.5x17.8x14        | B/ATX      | 6/2               | 0/8              | 300W/300W |
| 570/R                                                          | 150/370   | 8.3x17.3x26.4       | ATX        | 7/1               | 1/2              | 300W/300R |
| 571/R                                                          | 160/370   | 8.3x17.3x26.4       | ATX        | 6/1               | 1/2              | 300W/300R |
| 582                                                            | 105/120   | 7.8x16.5x23.2       | ATX        | 6/0               | 2/1              | 250W/300W |
| 588                                                            | 105/120   | 7.8x16.5x23.2       | ATX        | 5/0               | 1/3              | 250W/300W |
| 1400/R                                                         | 715       | 16x20x22.4          | F/ATX      | 14/0              |                  | 300H      |
| 1620/R                                                         | 950       | 16.5x20.3x34.3      | F/ATXx2    | 16/0              |                  | 300H      |
| * Case Color: Blue, Purple, Green, Orange, Red.                |           |                     |            |                   |                  |           |
| ** Case Color: Blue, Purple, Green, Red, Black.                |           |                     |            |                   |                  |           |
| Model# Starts with:                                            |           |                     |            |                   |                  |           |
| 1 for Slim Case                                                |           |                     |            |                   |                  |           |
| 2 for Desktop Case                                             |           |                     |            |                   |                  |           |
| 3 for Mini-Mid Case                                            |           |                     |            |                   |                  |           |
| 4 for Mid Case                                                 |           |                     |            |                   |                  |           |
| 5 for Full/File Server Case                                    |           |                     |            |                   |                  |           |
| Side Open: Side Panel can be removed independently             |           |                     |            |                   |                  |           |
| Slide Door: Sliding front door up and down                     |           |                     |            |                   |                  |           |
| Slide MB Plate: Motherboard tray ca slide in and out form rear |           |                     |            |                   |                  |           |
| MB SIZE = MOTHERBOARD SIZE • F= FULL SIZE • B= BABY SIZE       |           |                     |            |                   |                  |           |
| X-ATX • M-ATX = Micro ATX                                      |           |                     |            |                   |                  |           |
| R= REDUNDANT POWER SUPPLY WITH HARDSWAP                        |           |                     |            |                   |                  |           |
| 250XB= Ball Bearing                                            |           |                     |            |                   |                  |           |





**\$1099**  
**POCKET EPC-II**

- Intel Celeron 700MHz (P-III 800/933/1000MHz available)
- Intel 810E Chipset
- Built-in 56K V.90 Modem
- Built-in 10/100 Network
- 64MB SDRAM(max. 256MB)
- 10GB Hard Drive(max. 20GB)
- 4MB AGP Video Integrated
- 3D Sound Integrated
- 24x CD-ROM and Floppy Drive Included
- MS Windows ME CD
- 1-Year Limited Warranty



**\$535**

**HOME PC**

- PROCOMP 133Mhz Main Board
- 8MB AGP Video & 3D Stereo Sound
- 128MB PC133 SDRAM
- 20GB UDMA100 HDD
- 17" Digital SVGA .27mm Monitor
- 52x CD-ROM Drive
- 56K V.90 Fax/Modem
- Network Card built-in
- Win98 Keyboard & Scrolling Internet Mouse
- 120 Watts PMPO Stereo Speakers
- Free One Year On-Site Service
- 3-Year Limited Warranty
- MS Windows ME CD - add \$99
- 100MB Internal ZIP Drive - add \$49

|                       |        |           |
|-----------------------|--------|-----------|
| INTEL CELERON 700     | \$ 535 | (homx061) |
| INTEL CELERON 766     | \$ 545 | (homx062) |
| INTEL PENTIUM III 800 | \$ 625 | (homx063) |
| INTEL PENTIUM III 866 | \$ 635 | (homx064) |
| INTEL PENTIUM III 933 | \$ 655 | (homx065) |

**\$569**

**WORKSTATION PC**

- PROCOMP 133Mhz Main Board
- 128MB PC133 SDRAM upgrade: 256MB PC133 SDRAM @ \$59
- 20GB Ultra DMA100 Hard Drive upgrade: 30GB Ultra DMA100 Hard Drive @ \$29
- 52x CD-ROM Drive upgrade: 16x DVD @ \$45
- 8MB ATI Xpert 98 DVD Ready Graphics upgrade: 32MB ATI Xpert 2000 AGP @ \$29
- 10/100 D-Link Ethernet PCI Network Card upgrade: 10/100 3COM Ethernet Card @ \$35
- 17" Digital SVGA .27mm Monitor
- Win98 Keyboard & Scrolling Internet Mouse
- Free One Year On-Site Service
- 3-Year Limited Warranty
- MS Windows ME CD & Manual - add \$89
- 100MB Internal ZIP Drive - add \$49
- 56K V.90 Fax/Modem - add \$19
- IEEE-1394 PROCOMP Fire Wire PCI - add \$39

|                       |        |           |
|-----------------------|--------|-----------|
| INTEL CELERON 700     | \$ 569 | (womx061) |
| INTEL CELERON 766     | \$ 579 | (womx062) |
| INTEL PENTIUM III 800 | \$ 659 | (womx063) |
| INTEL PENTIUM III 866 | \$ 669 | (womx064) |
| INTEL PENTIUM III 933 | \$ 689 | (womx065) |

**\$1225**

**GAMER'S PRO**

([www.ibuypower.com/product-pc/gamer-pro.htm](http://www.ibuypower.com/product-pc/gamer-pro.htm))

- ASUS/AOPEN DDR 266FSB UDMA-100 MB
- 256MB DDR PC2100 SDRAM upgrade: 512MB DDR PC2100 SDRAM @ \$159
- 40GB Ultra DMA-100 HDD
- 52x Creative Lab CD-ROM
- 10x8x32 CD-Rewritable Drive
- 32MB ATI RADEON VE DDR Dual Monitor Out upgrade: 64MB ATI Radeon DDR w/VIVO @ \$109
- Yamaha 744 Digital Sound Card with SPDIF and Optical Fiber Cable
- 56K V.90 ZOOM Modem w/Voice
- 19" Digital SVGA Monitor, .26mm upgrade: 19" REAL FLAT SVGA .22mm @ \$99
- ALTEC LANSING ACS54 5 pcs Speakers
- Microsoft Intelli Mouse ; PS2 Win98 Keyboard
- MS Windows ME (Millennium) Edition
- Free Corel Office 2000 CD
- Free One Year On-Site Warranty

|                    |         |           |
|--------------------|---------|-----------|
| AMD ATHLON 900     | \$ 1225 | (gpmx061) |
| AMD ATHLON 1G HZ   | \$ 1249 | (gpmx062) |
| AMD ATHLON 1.1G HZ | \$ 1259 | (gpmx063) |
| AMD ATHLON 1.2G HZ | \$ 1279 | (gpmx064) |
| AMD ATHLON 1.3G HZ | \$ 1315 | (gpmx065) |
| AMD ATHLON 1.4G HZ | \$ 1349 | (gpmx066) |

**\$779**  
**POWER BEST BUY**

- VIA KT-133A/INTEL 815E UDMA-100 MB
- 128MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- 10x DVD-ROM Drive upgrade: 16x DVD-ROM @ \$35
- 10x8x32 CD-Rewritable @ \$59
- 8MB ATI Xpert 98 DVD Ready AGP Graphics upgrade: 32MB nVidia Riva TNT2 M64 @ \$29
- AC97 Stereo Sound upgrade: Sound Blaster Live! Value @ \$49
- 56K V.90 Fax/Modem w/Voice
- 17" Digital SVGA .27mm Monitor
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- MS Windows ME (Millennium) Edition
- 120 Watt Stereo Speaker System upgrade: Altec Lansing ACS33 Speakers @ \$39
- Free COREL Office 2000 CD
- Free One Year On-Site Service

|                       |        |            |
|-----------------------|--------|------------|
| AMD ATHLON 900        | \$ 779 | (pbbmx061) |
| AMD ATHLON 1GHZ       | \$ 815 | (pbbmx062) |
| AMD ATHLON 1.1GHZ     | \$ 829 | (pbbmx063) |
| AMD ATHLON 1.2G HZ    | \$ 845 | (pbbmx064) |
| INTEL PENTIUM III 800 | \$ 819 | (pbbmx065) |
| INTEL PENTIUM III 866 | \$ 859 | (pbbmx066) |
| INTEL PENTIUM III 933 | \$ 879 | (pbbmx067) |

**\$1579**

**GAMER'S DREAM**

Apr 2000 PC Gamer Editors' Choice Award

- ASUS/AOPEN DDR 266FSB UDMA-100 MB
- 256MB DDR PC2100 SDRAM
- 40GB 7200rpm Ultra DMA-100 HDD
- 16x DVD-ROM Drive
- 12x8x32 CD-Rewritable Drive
- IEEE 1394 Fire Wire 3 Ports w/ software & cable
- 64MB nVidia GeForce-2 Pro DDR 4X AGP
- Creative Lab Sound Blaster Live! Value upgrade: Sound Blaster Live X-Gamer 5.1 @ \$59
- 56K V.90 ZOOM Modem w/Voice
- 19" Digital SVGA Monitor, .26mm upgrade: 19" ViewSonic E90 .23mm @ \$99
- 19" ViewSonic GS790 .22mm @ \$179
- ALTEC LANSING ACS54 5 Pieces Speakers upgrade: Altec Lansing ADA305 Speakers @ \$69
- Microsoft Intelli Mouse & PS2 Win98 Keyboard
- MS Windows ME (Millennium) Edition
- Free COREL Office 2000
- Free One Year On-Site Warranty

|                    |         |           |
|--------------------|---------|-----------|
| AMD ATHLON 1G HZ   | \$ 1579 | (gdmx061) |
| AMD ATHLON 1.1G HZ | \$ 1595 | (gdmx062) |
| AMD ATHLON 1.2G HZ | \$ 1615 | (gdmx063) |
| AMD ATHLON 1.3G HZ | \$ 1645 | (gdmx064) |
| AMD ATHLON 1.4G HZ | \$ 1679 | (gdmx065) |

**\$829**  
**VALUE PERFORMER**

- VIA KT-133A/INTEL 815E UDMA-100 MB
- 128MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- 52x Creative Lab CD-ROM Drive upgrade: 10x8x32 CDRW Drive @ \$99
- 32MB nVidia Riva TNT-2 M64 4x AGP Video upgrade: 32MB nVidia GeForce-2 MX @ \$45
- AC97 Stereo Sound upgrade: Yamaha-744 Digital w/SPDIF @ \$29
- 56K V.90 ZOOM Modem w/Voice
- 17" Digital SVGA Monitor, .27mm
- 480 Watt Subwoofer Speaker System upgrade: Flat Panel Subwoofer Speakers @ \$29
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- MS Windows ME (Millennium) Edition
- Free COREL Office 2000 & Norton 2001 CD
- Free One Year On-Site Service
- 100MB Internal ZIP Drive - add \$49

|                         |        |           |
|-------------------------|--------|-----------|
| AMD ATHLON 1GHZ         | \$ 829 | (vamx061) |
| AMD ATHLON 1.1G HZ      | \$ 849 | (vamx062) |
| AMD ATHLON 1.2G HZ      | \$ 879 | (vamx063) |
| INTEL PENTIUM III 866   | \$ 859 | (vamx064) |
| INTEL PENTIUM III 933   | \$ 889 | (vamx065) |
| INTEL PENTIUM III 1G HZ | \$ 919 | (vamx066) |

**\$999**

**PENTIUM-4 999**

([www.ibuypower.com/product-pc/p4-999.htm](http://www.ibuypower.com/product-pc/p4-999.htm))

- INTEL i850 Chip UDMA-100 Pentium-4 MB
- 128 MB PC800 RDRAM Memory
- 40GB Ultra DMA-100 HDD upgrade: 60GB UDMA-100 HDD @ \$79
- 10x DVD-ROM Drive
- 8x4x32 CD-Rewritable
- 32MB nVidia Riva TNT-2 4X AGP upgrade: 32MB ATI Radeon DDR @ \$39
- 64MB ATI Radeon DDR w/VIVO @ \$149
- 120 Watt Subwoofer Speaker System upgrade: 480W Subwoofer Speakers @ \$19
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- 10/100 INTEL Ethernet Network Onboard
- AC-97 Stereo 3D Sound upgrade: Sound Blaster Live Value @ \$49
- 56K V.90 Modem w/Voice
- MS Windows ME (Millennium) Edition
- 100MB Internal ZIP Drive - add \$49
- 19" SVGA .26mm Monitor - add \$249

|                        |         |            |
|------------------------|---------|------------|
| INTEL PENTIUM 4 1.3GHZ | \$ 999  | (p49mx061) |
| INTEL PENTIUM 4 1.4GHZ | \$ 1029 | (p49mx062) |
| INTEL PENTIUM 4 1.5GHZ | \$ 1089 | (p49mx063) |
| INTEL PENTIUM 4 1.7GHZ | \$ 1199 | (p49mx064) |



**\$1295**  
**DREAM 2001**

Jan, Feb & Mar 2001 BEST BUY Awards

- VIA KT-133A/INTEL 815E UDMA-100 MB
- 256MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- 10x8x32 CD-Rewritable & 16x DVD-ROM Drive
- 32MB nVidia GeForce-2 GTS DDR 4x AGP
- Creative Lab Sound Blaster Live! Value upgrade: Sound Blaster Live MP3+ 5.1 @ \$59
- IEEE-1394 Fire Wire 3 Ports w/ software & cable
- 56K V.90 ZOOM Modem w/Voice
- 19" Digital SVGA Monitor, .26mm
- PS2 Win98 Keyboard & Scrolling Internet Mouse upgrade: MS Optical Intelli-Mouse @ \$49
- ALTEC LANSING ACS54 5 Pieces Speakers
- MS Windows ME (Millennium) Edition
- Free COREL Office 2000 & Norton 2001 CD
- Free One Year On-Site Service

|                         |         |           |
|-------------------------|---------|-----------|
| AMD ATHLON 1G HZ        | \$ 1299 | (demx061) |
| AMD ATHLON 1.1G HZ      | \$ 1319 | (demx062) |
| AMD ATHLON 1.2G HZ      | \$ 1345 | (demx063) |
| AMD ATHLON 1.3G HZ      | \$ 1385 | (demx064) |
| AMD ATHLON 1.4G HZ      | \$ 1425 | (demx065) |
| INTEL PENTIUM III 866   | \$ 1295 | (demx066) |
| INTEL PENTIUM III 1G HZ | \$ 1349 | (demx067) |

**\$1499**

**PENTIUM-4 SUPREME**

([www.ibuypower.com/product-pc/supreme.htm](http://www.ibuypower.com/product-pc/supreme.htm))

- INTEL i850 Chip UDMA-100 Pentium-4 MB
- 256 MB PC800 RDRAM Memory
- 40GB Ultra DMA-100 HDD
- 16x DVD-ROM Drive
- 10x8x32 CD-Rewritable
- 32MB nVidia GeForce-2 MX 4x AGP upgrade: 32MB GeForce-2 GTS DDR @ \$89
- AC-97 Stereo 3D Sound upgrade: Sound Blaster Live Value @ \$49
- 56K V.90 ZOOM Modem w/Voice
- 10/100 INTEL Ethernet Network Onboard
- 19" ViewSonic E90 SVGA Monitor, .23mm upgrade: 19" ViewSonic GS790 .22mm @ \$79
- 480 Watt PMPO Subwoofer Speaker System upgrade: Flat Panel Subwoofer Speakers @ \$29
- PS/2 Mouse & Win98 Keyboard
- MS Windows ME (Millennium) Edition
- Free COREL Office 2000 CD
- Free One Year On-Site Warranty

|                        |         |           |
|------------------------|---------|-----------|
| INTEL PENTIUM 4 1.3GHZ | \$ 1499 | (p4mx061) |
| INTEL PENTIUM 4 1.4GHZ | \$ 1525 | (p4mx062) |
| INTEL PENTIUM 4 1.5GHZ | \$ 1589 | (p4mx063) |
| INTEL PENTIUM 4 1.7GHZ | \$ 1699 | (p4mx064) |



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512MB PC266 DDR Memory  
Pioneer 16X DVD  
Plextor 12x10x32 CD-RW  
gForceII 64MB DDR Graphic Card  
Sound Blaster Live Value Card  
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10/100 TB NIC & 1.44MB FDD & Mic  
5Pcs. Subwoofer/Speakers System  
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Multimedia Scrolling Mouse  
Mid ATX Tower Case/300W  
Win98 2nd Edition  
Corel WordPerfect Office2000  
Webster's Encyclopedia  
1 year limited Warranty

**\$2,379**

### AGC Ultra Sonic

Intel Pentium III 933 MHz  
Intel 815EP Chip Mainboard  
2 USB Ports  
40GB UATA100 HDD  
256MB PC-133 SDRAM  
8X4X32 CD-RW  
12X DVD  
nVidia gForceII MX 32MB Card  
Sound Blaster Live Value  
3Com USR PCI 56K Modem  
10/100 TB NIC  
1.44MB FDD & Mic  
3 Pcs. Subwoofer/Speaker System  
Multimedia Keyboard  
Scrolling Mouse  
Mid ATX Tower Case  
W98 2nd edition  
Webster's Encyclopedia  
Corel Word Perfect Office 2000  
1 year Limited Warranty  
Monitor sold separately

**\$1,229**

### AGC Super A-10

VIA KT133 Mainboard  
AMD Thunderbird 900MHz  
2 USB Ports  
30GB UATA100 HDD  
128MB fast SDRAM  
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Intel 815E Chip Mainboard  
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Intel 3D Sound (on board)  
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No OS, W98 2nd Edition add \$99

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### AGC Super B1

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Mid ATX Tower Case  
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No OS, W98 2nd Edition add \$99

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AMD Thunderbird 800...\$439  
17" .27 super Monitor....\$175

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Intel Pentium III 650 MHz  
Intel 810 Chip Mainboard  
2 USB Ports  
20GB UATA 66 HDD  
64MB PC-100 SDRAM  
56X CD-ROM  
Intel Graphic (on board, shared)  
Intel 3D Sound (on board)  
Intel chip PCI 56K V.90 Modem  
1.44MB FDD & Mic  
Multimedia Speakers  
PS2 Keyboard & Mouse  
Mid ATX Tower Case  
1 year Limited Warranty  
Monitor sold separately  
No OS, W98 2nd Edition add \$99

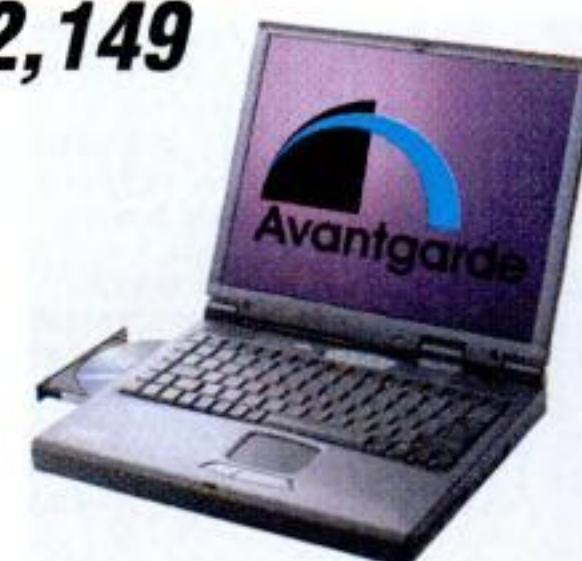
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Intel Pentium III 700.....\$519

### AGC Super Slimbook

Intel Pentium III 800MHz  
SpeedStep Tech  
128MB SDRAM  
20GB HDD  
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Aluminum-Alloy Cover  
ATI Mobility-M 4MB SGRAM AGP  
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3D Surround Sound  
56K V.90 Modem & 10/100 NIC  
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Mic. & Stereo Speakers  
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W98 2nd Edition

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Li-Ion Smart Battery  
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Dual Processor Upgradable  
128MB ECC SDRAM  
9GB SCA-80 Hard Drive  
52X CD-ROM  
1.44 MB Floppy Drive  
Integrated 2MB Video  
Integrated 10/100 NIC  
Integrated SCSI Controller  
Two 32-bit PCI Slots  
300W Power Supply  
Pentium III 800: **\$1,899**  
Pentium III 850: **\$1,949**

### AGC 2U Rack Sever

2U Rack Case  
Intel L440 GX-G Sever Board  
Dual Processor Upgradable  
256MB ECC SDRAM  
9GB 7200rpm U2W SCSI HDD  
52X CD-ROM  
1.44 MB Floppy Drive  
Integrated 2MB Video  
Integrated 10/100 NIC  
Integrated SCSI Controller  
Two 32-bit PCI Slots  
300W Power Supply  
Pentium III 750: **\$1,779**  
Pentium III 800: **\$1,849**



### Industrial Rack-Mount Server Chassis

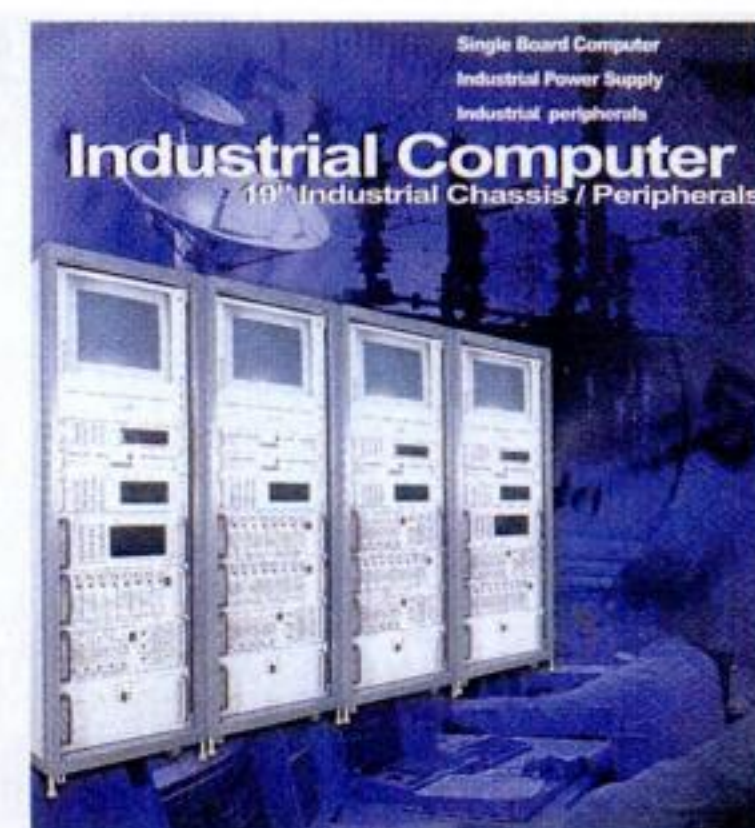
|                     |       |
|---------------------|-------|
| 1U with 150W        | \$219 |
| 2U with 300W        | \$249 |
| 2U SAC-80 with 300W | \$499 |
| 5U                  | \$319 |
| 5U with 300W        | \$369 |
| 6U                  | \$399 |
| 8U                  | \$669 |

### Power Supply

|                                 |       |
|---------------------------------|-------|
| 300W AT/ATX Power Supply        | \$50  |
| 300W AT Redundant Power Supply  | \$260 |
| 300W ATX Redundant Power Supply | \$290 |

### Industrial Rack-Mount Storage Chassis

|              |       |
|--------------|-------|
| 2U with 300W | \$199 |
| 3U with 300W | \$199 |
| 4U           | \$165 |
| 5U           | \$269 |



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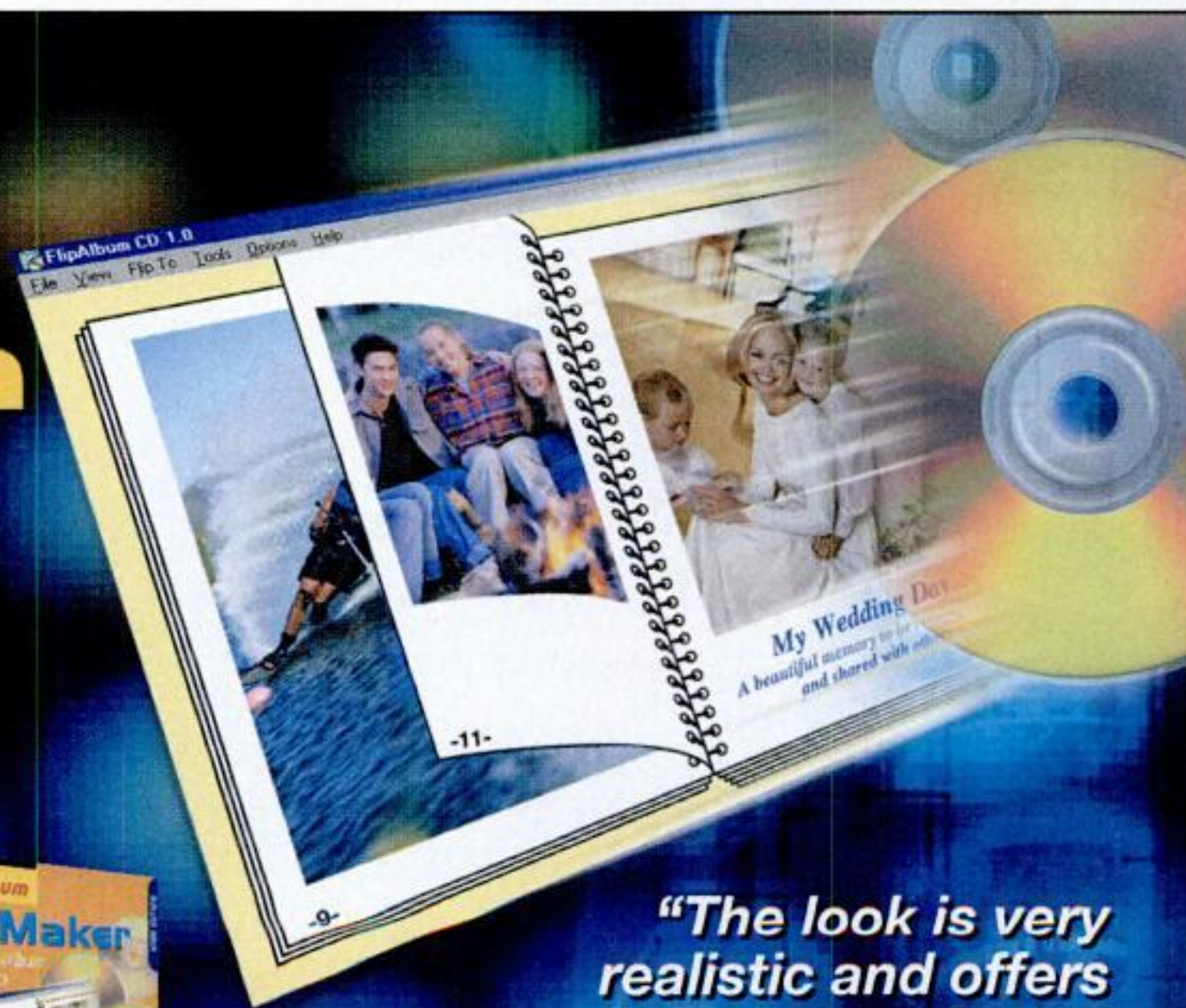
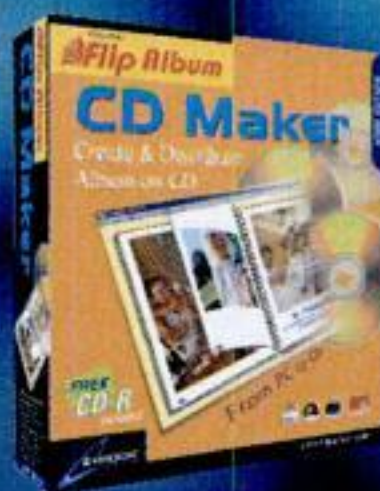
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**"The look is very realistic and offers the user the feel of flipping through a real photo album."**

San Jose Mercury News  
17 Feb 2001

**"The digital photo album you have got to get."**

Gregory Georges, eDIGITALPHOTO.com  
March/April 2001



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### VALUE GAMING SYSTEM

- AMD 1.1GHz Athlon Thunderbird Processor
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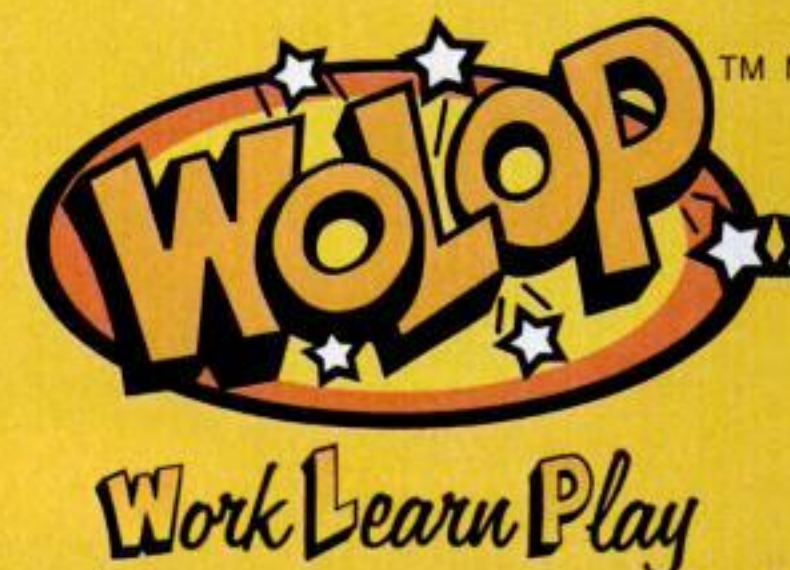
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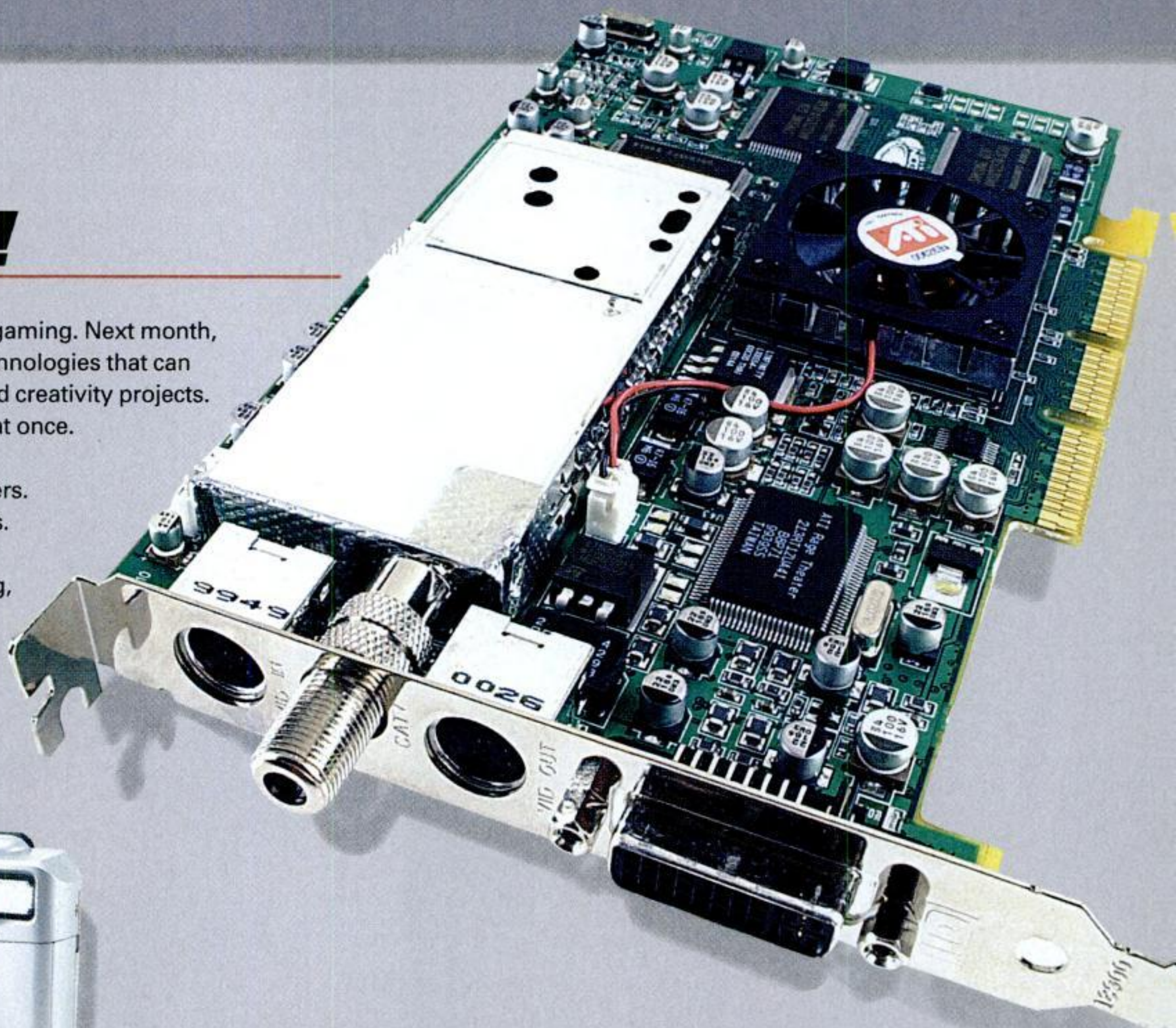
# Coming Next Month

IN THE MAXIMUM PC JULY ISSUE!

## Wild Cards!

Not every videocard is dedicated to 3D gaming. Next month, we take a close look at five eclectic technologies that can supercharge your home entertainment and creativity projects.

- ▶ Dual-head cards for using two monitors at once.
- ▶ HDTV cards for next-gen boob-tubing.
- ▶ Content-creation cards for digital designers.
- ▶ MPEG-2 decoder cards for PC theater rigs.
- ▶ And do-everything cards that support TV tuning, TV time-shifting, MPEG-2 decoding, video capture, and—yes!—even 3D acceleration.



## Ultimate Digital Darkroom

Everything you need to know about digital cameras, photo printers, image-editing software, and online photo-sharing. We'll show you how to pick the best gear, and review the hottest products of each breed.

### Plus:

#### Now This Is 3D Gaming!

The beauty of the GeForce3's pixel and vertex shaders must be seen to be appreciated. In stunning detail, we present the best 3D gaming graphics ever.

#### Protect & Destroy

How to protect the most valuable files on your PC from crashes and hacks—and how to destroy all your personal data before you send an old PC on its merry way.

#### Personalize Everything!

We show you how to recreate your Windows interface in your own image. Personalize your Start button, your event sounds, your entire desktop. *Personalize everything.*

#### Also...

Reviews of a 1.7GHz Pentium 4 powerhouse, Pioneer's new DVD-R drive, Hand Era's latest Palm device, Sony's new CD-RW that does MP3 decoding on the fly, and much, much more!



## Anatomy of a Vendor Meeting

Ah, the dreaded vendor meeting. It's a black-humor comedy starring a visiting PR team in the role of The Unremitting and a deflated tech journalist in the role of The Uninterested. Would you like a briefing on our company history? Perhaps. Would you like to talk to our lead engineer? *Perhaps*. What does this product mean to you? I don't know—what do you want it to mean to me?

The PR patter is littered with so much manipulative intent, it could have been lifted directly from the script of *Glengarry Glen Ross*. Indeed, by the time the dog-and-pony show is over, the journalist doesn't know

whether he's been coerced into buying a piece of Florida swampland or solicited for free publicity. Now don't get us wrong: When it comes to hardware that we actually care about, we love seeing live-action demos. But when it comes to useless widgets born of bad ideas and too much free-flowing venture capital, we'd just as soon read the press release.

And surely the exhausted PR folks on the other side of the table feel pretty icky about the whole affair as well.

—JON PHILLIPS



**1 The Boob:** 0 percent technical knowledge, 0 percent charm, 100 percent slippery, rodent-like guile.

**2 The Babe:** 5 percent technical knowledge, 95 percent charm, 0 percent interest in the journalist no matter how many times he asks for a date.

**3 The Brain:** 95 percent technical knowledge, 5 percent charm, 0 percent interest in changing his underwear more than once every three days.

**4 The Bored:** 0 percent interest in what The Boob has to say, 0 percent interest in what The Brain has to say, 100 percent interest in what The Babe's boobs have to say.

### 5 Business Card Exchange:

No vendor meeting is complete without the ritualistic exchange of business cards. Little do the vendor reps know that they're actually receiving the card of Jimmy Battino, the guy who repairs our air conditioning system.

**6 Press Kit:** Contains a volume of product information for the journalist to read at his leisure. After the meeting is over, the journalist will throw the kit in the garbage, then someone else will come along and throw used coffee grounds on top of the kit.

### 7 New Product:

Today, the editor will learn the wonders of MiniSoft's latest PC peripheral—because, as the

press kit so succinctly reminds us, "Sometimes you just need a duck." The final shipping product will perform all of the most important waterfowl functions, but the prototype sitting on the table is a non-working beta unit.

**8 Worthless Tchotchke:** During the meeting: "Wow! A stuffed duck!" After the meeting: "Wow. A stuffed duck."



# for newer technology, you'd need government clearance.

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So you forgot to return a few library books and couldn't get into the FBI Academy. Well, here at Dell™, we don't discriminate. All of our customers are afforded the latest and greatest technology. Like the Inspiron™ 8000 with unbelievably smooth, clean graphics – it's the ultimate balance of uncompromising performance and mobility. And, of course, we have all of the latest in printers, scanners and software. So call on us to help build your perfect system or choose from one of the great systems below. Even easier than getting a library card.



Dell™ Inspiron™ 8000 Notebook

## DELL™ NOTEBOOKS:

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- 14.1" XGA TFT Display
- 64MB 100MHz SDRAM
- 5GB<sup>5</sup> Ultra ATA Hard Drive
- Modular 24X Max CD-ROM Drive
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- Intel® Pentium® III Processor at 700MHz
- 15" Super XGA+ TFT Display
- 128MB 100MHz SDRAM
- 10GB<sup>5</sup> Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- Internal 56K Capable<sup>6</sup> FaxModem
- 59WHr Li-Ion Battery
- harman/kardon® Audio
- MS® Works Suite 2001 ■ MS® Windows® Me
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### DELL™ INSPIRON™ 8000

#### Multimedia Mobile Desktop

- Intel® Pentium® III Processor at 1GHz
- 15" Super XGA+ TFT Display
- 128MB 100MHz SDRAM
- 20GB<sup>5</sup> Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- Internal 56K Capable<sup>6</sup> FaxModem
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- 48X Max CD-ROM Drive
- SoundBlaster 64V PCI LC Sound Card
- harman/kardon® Speakers
- 56K Capable<sup>6</sup> PCI DataFax Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
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### DELL™ DIMENSION™ 4100 Series

#### Advanced Performance, Smart Value

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- 17" (16.0" vis, .28dp) E770 Monitor
- 16MB ATI® Rage™ Pro
- 8X/4X/32X Max CD-RW/DVD-ROM Combo Drive
- SoundBlaster 64V PCI LC Sound Card
- harman/kardon® Speakers
- 56K Capable<sup>6</sup> PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty<sup>2</sup> ■ 1-Yr At-Home Service<sup>4</sup>
- 1 Year of DellNet™ by MSN® Internet Access<sup>10</sup> Included

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- 40GB<sup>5</sup> Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" vis, .26dp) M781s Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 8X/4X/32X Max CD-RW Drive
- SB Live! Value Digital
- Harman Kardon® HK-695 Surround Sound Speakers with Subwoofer
- 56K Capable<sup>6</sup> PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty<sup>2</sup>
- 1-Yr At-Home Service<sup>4</sup>
- 1 Year of DellNet™ by MSN® Internet Access<sup>10</sup> Included

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- 32MB DDR ATI® Radeon™ 4X AGP Graphics
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- SB Live! Value Digital
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- 56K Capable<sup>6</sup> PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty<sup>2</sup>
- 1-Yr At-Home Service<sup>4</sup>
- 1 Year of DellNet™ by MSN® Internet Access<sup>10</sup> Included
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- HP® ScanJet® 4300Cse, add \$99 after \$50
- HP® Mail-in Rebate<sup>38</sup> (Reg. \$149)

#### Power Protection:

- APC Pro8T2 SurgeArrest, add \$39

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are getting  
better and  
better.



## DELL™ INSPIRON™ 8000

### Multimedia Mobile Desktop

- Intel® Pentium® III Processor at 700MHz
- 15" Super XGA+ TFT Display
- 128MB 100MHz SDRAM
- 10GB<sup>5</sup> Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
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**1.5GHz.**  
my friends  
are envious.  
my enemies  
are scared.



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##### Cutting-Edge Technology

- Intel® Pentium® 4 Processor at 1.5GHz
- 128MB RDRAM
- 20GB<sup>5</sup> Ultra ATA Hard Drive
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- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 48X Max CD-ROM Drive
- harman/kardon® Speakers
- SoundBlaster 64V PCI LC Sound Card
- 56K Capable<sup>6</sup> PCI Telephony Modem
- MS® Works Suite 2001
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